REPORT 55

SWEEP

SOIL AND WATER

ENVIRONMENTAL

ENHANCEMENT PROGRAM

PAMPA

PROGRAMME D'AMELIORATION

DU MILIEU PEDOLOGIQUE

ET AQUATIQUE

Canada

Ontario

SWEEP

is a $30 million federal-provincial agreement, announced May 8, 1986, designed to improve soil and water quality in southwestern Ontario over the next five years.

PURPOSES

There are two interrelated purposes to the program; first, to reduce phosphorus loadings in the Lake Erie basin from cropland run-off; and second, to improve the productivity of southwestern Ontario agriculture by reducing or arresting soil erosion that contributes to water pollution.

BACKGROUND

The Canada-U.S. Great Lakes Water Quality Agreement called for phosphorus reductions in the Lake Erie basin of 2000 tonnes per year. SWEEP is part of the Canadian agreement, calling for reductions of 300 tonnes per year — 200 from croplands and 100 from industrial and municipal sources.

PAMPA

est une entente fédérale-provinciale de 30 millions de dollars, annoncée le 8 mai 1986, et destinée à améliorer la qualité du sol et de l'eau dans le Sud-ouest de l'Ontario.

SES BUTS

Les deux buts de PAMPA sont: en premier lieu de réduire de 200 tonnes par an d'ici 1990 le déversement dans le lac Erie de phosphore provenant des terres agricoles, et de maintenir ou d'accroître la productivité agricole du Sud-ouest de l'Ontario, en réduisant ou en empêchant l'érosion et la dégradation du sol.

SES GRANDES LIGNES

L'entente entre le Canada et les États-unis sur la qualité de l'eau des Grands Lacs prévoyait de réduire de 2 000 tonnes par an la pollution due au phosphore dans le bassin du lac Erie. PAMPA fait partie de cette entente qui réduira cette pollution de 300 tonnes par an — 200 tonnes provenant des terres agricoles et 100 tonnes provenant de sources industrielles et municipales.

100-05282/

TECHNOLOGY EVALUATION AND DEVELOPMENT SUB-PROGRAM

SOIL LOSS BY TILLAGE EROSION: THE EFFECTS OF TILLAGE IMPLEMENT, SLOPE GRADIENT, AND TILLAGE DIRECTION ON SOIL TRANSLOCATION BY TILLAGE

FINAL REPORT

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EXECUTIVE SUMMARY

In the preceding study entitled "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" net downslope soil translocation by tillage, tillage erosion, was identified as a major cause of the severe soil loss observed on upper slope landscape position in the complex topography of southwestern Ontario. This study examined the processes of soil translocation and tillage erosion in greater depth than the preceding study. The effect of tillage implement type on the magnitude of soil translocation and net downslope soil translocation by tillage under a range of slope gradients within a typical upland landscape was examined. The effects of other factors such as soil conditions, tillage depth, and tillage ground speed were also examined.

Soil translocation by four tillage implements, chisel plow, moldboard plow, tandem disc, and C-tine cultivator, was measured on a range of slope gradients in both upslope and downslope directions on two topographically complex, but similar, field sites in Huron County. The soil texture of both field sites was sandy loam. Soil translocation was measured using the tracer-pulse method. Chloride was utilized as the labelling element to generate the tracer-pulse. Soil translocation was calculated using the synthetic step response distribution synthesized from a succession of convoluted Cl pulse response distributions. Soil loss caused by tillage erosion was measured as the net downslope soil translocation by tillage. Paired plots were utilized to calculate net downslope soil translocation from upslope and downslope tillage operations.

Measurements of soil translocation, net downslope translocation and soil loss for all four tillage implements and for treatments of tillage implements were characterized as highly variable. The consequence of this variability was that soil loss and accumulation were observed throughout the topography, regardless of slope position. Although this variability existed, net soil losses were observed on the upper slope landscape positions for all four tillage implements, indicating that less soil is translocated upslope than downslope by each tillage implement. The chisel plow, moldboard plow, tandem disc and cultivator all caused tillage erosion which resulted

in soil loss.

Measured soil losses resulting from two passes, one upslope and the second downslope, of the chisel plow, moldboard plow, tandem disc and cultivator, when averaged over the linear and convex upper slope landscape positions, were 0.19 kg m^{-2}, 0.05 kg m^{-2}, 0.43 kg m^{-2}, and 0.54 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the average soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were estimated to be 0.09 kg m^{-2} (0.9 t ha^{-1}), 0.03 kg m^{-2} (0.3 t ha^{-1}), 0.22 kg m^{-2} (2.2 t ha^{-1}), and 0.27 kg m^{-2} (2.7 t ha^{-1}), respectively.

Maximum measured soil losses between plots within the upper slope landscape positions resulting from two passes, one upslope the other downslope, of the chisel plow, moldboard plow, tandem disc and cultivator were 2.96 kg m^{-2}, 4.34 kg m^{-2}, 1.14 kg m^{-2}, and 2.97 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the maximum soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were estimated to be 1.48 kg m^{-2} (14.8 t ha^{-1}), 2.17 kg m^{-2} (21.7 t ha^{-1}), 0.57 kg m^{-2} (5.7 t ha^{-1}), and 1.49 kg m^{-2} (14.9 t ha^{-1}), respectively.

The range between minimum and maximum values of soil translocation for each tillage implement provided indicators of potential net downslope soil translocation. The ranges for the chisel plow, moldboard plow, tandem disc and cultivator were 33.6 kg m^{-1}, 38.5 kg m^{-1}, 26.9 kg m^{-1}, 20.0 kg m^{-1}, respectively. The potential soil losses from the upper slope landscape positions, based on these ranges, for the chisel plow, moldboard plow, tandem disc and cultivator were estimated to be 0.51 kg m^{-2}, 0.60 kg m^{-2}, 0.55 kg m^{-2}, 0.47 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the potential soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were 0.26 kg m^{-2} (2.6 t ha^{-1}), 0.30 kg m^{-2} (3.0 t ha^{-1}), 0.28 kg m^{-2} (2.8 t ha^{-1}), and 0.29 kg m^{-2} (2.9 t ha^{-1}). Maximum absolute values of net downslope soil translocation for each tillage implement also provided indicators of potential soil loss. The maximum absolute values for the chisel plow, moldboard plow, tandem disc and cultivator were 30.4 kg m^{-1}, 17.8 kg m^{-1}, 26.9 kg m^{-1}, 14.6 kg m^{-1}, respectively.

All four tillage implements are considered erosive, however, the relative erosivity of the four implements could not be assessed conclusively because of the variability in the data. These observed values of soil loss are relatively small, but exceed acceptable limits. The rate of soil loss within complex topography is clearly scale dependent.

The results indicated that there are relationships between soil translocation and slope gradient, tillage depth and tillage ground speed, however, these relationships are not always strong nor are they consistent between tillage implements, or within tillage treatments of tillage implements. There was some indication that soil translocation increased as slope gradient, tillage ground speed, and tillage depth increased. There was also some indication that ground speed increased as slope gradient increased, that ground speed decreased as tillage depth increased, and that tillage depth increased as slope gradient increased.

The inconsistency in these relationships suggests that there are other factors involved in the translocation of soil by tillage other than slope gradient, tillage depth and tillage ground speed. The shape and arrangement of tillage tools, and the responsiveness of tillage operator, as well as slope gradient, tillage depth and tillage ground speed, may also affect soil translocation. In theory, the volume of soil translocated is determined by the tillage depth and the shape and arrangement of the tillage tools; the mass of soil translocated is determined by the soil bulk density; and the extent of the translocation is determined by the shape of the tillage tools, the ground speed of the tillage implement and the slope gradient. The tillage operator continuously adjusts both tillage depth and tillage ground speed, through the adjustment of gear ratio, to compensate for the effect of gravity on the mass of the tillage equipment as it moves through the landscape. The degree to which the operator has to adjust tillage depth and ground speed will depend on the tractor-implement match.

The implications of this study reaffirm the implications of the preceding study "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b). In brief, those implications were: 1) soil loss caused by tillage erosion is not restricted to shoulder slope landscape

positions; 2) predictive soil loss and crop productivity models that do not include the process of tillage erosion do not represent reality on cultivated agricultural land in complex topography; and 3) preventative and corrective soil loss measures that do not include the reduction of tillage erosion will not be effective in controlling soil loss on upper slope landscape positions of cultivated agricultural land.

Implications arising directly from this study include: 1) factors affecting tillage erosion include not only slope gradient and curvature, tillage depth, tillage ground speed and soil conditions, but also tillage tool shape and arrangement, tractor-implement match and the response of the tillage operator to changing slope gradient; and 2) studies which examine single tillage operations of specific tillage implements with limited replications have the potential to generate highly variable data due to the numerous factors involved, resulting in observations of soil loss and soil accumulation throughout the topography.

Recommendations to reduce tillage erosion induced soil losses on upper slope landscape positions in the upland regions of southwestern Ontario were outlined in the preceding study "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b). In brief, those recommendations were: 1) reduce tillage frequency; 2) reduce tillage intensity; 3) reduce the size of tillage implements; and 4) vary tillage patterns within fields. All four tillage implements were found to be erosive, but it could not be concluded which of the above recommendations would provide the greatest reductions in soil loss resulting from tillage erosion.

Recommendations for further research are: 1) develop a practical and accurate method of measuring tillage depth for both primary and secondary tillage operations; 2) conduct more rigorous studies of the effects of slope gradient and curvature, tillage depth, and tillage ground speed on soil translocation and tillage erosion; 3) examine the role of tillage tool shape and arrangement, tillage operator, and tractor-implement match on soil translocation and tillage erosion; 4) examine soil translocation and tillage erosion under a broad range of soil conditions to determine the effects of soil texture and soil moisture content on soil translocation.

TABLE OF CONTENTS

LIST OF TABLES iii

LIST OF FIGURES iv

1.0 INTRODUCTION 1

2.0 OBJECTIVES 5

3.0 MATERIALS AND METHOD 6
- 3.1 Experimental Design 6
- 3.2 Primary Tillage Treatments, 1990 Field Experiments 7
- 3.2.1 Experimental Plots 8
- 3.2.2 Incorporation of Tracer 9
- 3.2.3 Tillage Equipment and Operations 11
- 3.2.4 Sampling Method 12
- 3.2.5 Chemical Analysis of Tracer 13
- 3.3 Secondary Tillage Treatments, 1991 Field Experiments 14
- 3.3.1 Experimental Plots 14
- 3.3.2 Incorporation of Tracer 15
- 3.3.3 Tillage Equipment and Operations 16
- 3.3.4 Sampling Method 17
- 3.3.5 Chemical Analysis of Tracer 17
- 3.4 Ground Speed Experiments 18

4.0 RESULTS AND DISCUSSION 19
- 4.1 Soil Properties 19
- 4.2 Landscape Topography 23
- 4.3 Soil Translocation 28
- 4.4 Net Downslope Soil Translocation 35
- 4.5 Effect of Slope Gradient on Soil Translocation and Net Downslope Translocation 42
- 4.6 Effect of Tillage Ground Speed on Soil Translocation 43
- 4.6.1 Ground Speed Experiments 43
- 4.7 Effect of Tillage Depth on Soil Translocation 52
- 4.8 Effect of Slope Gradient on Tillage Ground Speed 56
- 4.9 Effect of Slope Gradient on Tillage Depth 56
- 4.10 Effect of Tillage Depth on Tillage Ground Speed 57

5.0 SUMMARY 58

6.0 IMPLICATIONS 60

7.0 RECOMMENDATIONS 61

8.0 REFERENCES 62

APPENDIX A: Chemical and Physical Analysis of Muriate of Potash (KCl) 64

APPENDIX B: Description of Instrumentation Mounted of Tillage Equipment Used to Monitor Ground Speed and Slope Gradient 67

APPENDIX C: Experimental Data Including Soil Bulk Density, Soil Moisture Content, Chloride Content, Pulse Response Distributions, and Soil Translocation Calculations from Tillage Implement Experiments 73

APPENDIX D: Experimental Data Including Soil Bulk Density, Soil Moisture Content, Chloride Content, Pulse Response Distributions, and Soil Translocation Calculations from Ground Speed Experiments 135

LIST OF TABLES

Table 4.1: Chisel Plow Field Data and Soil Translocation Measurements 29

Table 4.2: Moldboard Plow Field Data and Soil Translocation Measurements . 30

Table 4.3: Tandem Disc Field Data and Soil Translocation Measurements 31

Table 4.4: Cultivator Field Data and Soil Translocation Measurements 32

Table 4.5: Net Downslope Translocation 36

Table 4.6: Soil Loss by Primary Tillage 37

Table 4.7: Soil Loss by Secondary Tillage Implements 38

Table 4.8: Soil Translocation Measurements for Ground Speed Experiments . 52

LIST OF FIGURES

Figure 3.1: Design of plots used to establish tracer pulse. 8

Figure 3.2: Primary tillage field site showing tillage treatments and plot sites. 10

Figure 3.3: Sample area showing plot slices and tillage direction. 12

Figure 3.4: Secondary tillage field site showing tillage treatments and plot sites. 15

Figure 4.1a: Field soil bulk density before primary tillage treatments, M. Lobb field site. 20

Figure 4.1b: Field soil bulk density after chisel plow treatments, M. Lobb field site. 20

Figure 4.1c: Field soil bulk density after moldboard plow treatments, M. Lobb field site. 21

Figure 4.2a: Field soil bulk density before tandem disc treatments, G. Lobb field site. 21

Figure 4.2b: Field soil bulk density after tandem disc treatments, G. Lobb field site. 22

Figure 4.3a: Field soil bulk density before cultivator treatments, G. Lobb field site. 22

Figure 4.3b: Field soil bulk density after cultivator treatments, G. Lobb field site. 23

Figure 4.4: Slope profile of chisel plow treatments, M. Lobb field site. 24

Figure 4.5: Slope profile of moldboard plow treatments, M. Lobb field site. 25

Figure 4.6: Slope profile of tandem disc treatments, G. Lobb field site. 26

Figure 4.7: Slope profile of cultivator treatments, G. Lobb field site. 27

Figure 4.8: Soil translocation by chisel plow. 33

Figure 4.9: Soil translocation by moldboard plow. 33

Figure 4.10: Soil translocation by tandem disc. 34

Figure 4.11: Soil translocation by cultivator. 34

Figure 4.12: Net downslope soil translocation by chisel plow. 39

Figure 4.13: Net downslope soil translocation for the moldboard plow. 39

Figure 4.14: Net downslope soil translocation for the tandem disc. 40

Figure 4.15: Net downslope soil translocation for the cultivator. 40

Figure 4.16: Effect of slope gradient on soil translocation - chisel plow treatments. 44

Figure 4.17: Effect of slope gradient on soil translocation - moldboard plow treatments. 44

Figure 4.18: Effect of slope gradient on soil translocation - tandem disc treatments. 45

Figure 4.19: Effect of slope gradient on soil translocation - cultivator treatments. 45

Figure 4.20: Effect of slope gradient on net downslope soil translocation - chisel plow treatments. 46

Figure 4.21: Effect of slope gradient on net downslope soil translocation - moldboard plow treatments. 46

Figure 4.22: Effect of slope gradient on net downslope soil translocation - tandem disc treatments. 47

Figure 4.23: Effect of slope gradient on net downslope soil translocation - cultivator treatments. 47

Figure 4.24: Tillage ground speed - chisel plow treatments. 48

Figure 4.25: Tillage ground speed - moldboard plow treatments. 48

Figure 4.26: Tillage ground speed - tandem disc treatments. 49

Figure 4.27: Tillage ground speed - cultivator treatments. 49

Figure 4.28: Effect of ground speed on soil translocation - chisel plow treatments. 50

Figure 4.29: Effect of ground speed on soil translocation - moldboard plow treatments. 50

Figure 4.30: Effect of ground speed on soil translocation - tandem disc treatments. 51

Figure 4.31: Effect of ground speed on soil translocation - cultivator treatments. 51

Figure 4.32: Till layer depth after tillage - chisel plow treatments. 53

Figure 4.33: Till layer depth after tillage - moldboard plow treatments. 54

Figure 4.34: Till layer depth after tillage - tandem disc treatments. 54

Figure 4.35: Till layer depth after tillage - cultivator treatments. 55

Figure 4.36: Tillage depth - moldboard plow treatments. 55

1.0 INTRODUCTION

One of the most significant agricultural/environmental problems currently facing our society is the severe soil loss on upper slope landscape positions of cultivated agricultural land. Visual evidence of severe soil loss of this nature can be found throughout the upland regions of southwestern Ontario in the form of exposed subsoil and undercut fencerows on the convex areas of ridges and knolls. Battiston et al. (1987) estimated rates of soil loss in excess of 150 t ha^{-1} yr^{-1} on shoulder slope positions within twelve cultivated field sites in the Regional Municipality of Waterloo. These rates of soil loss have been confirmed by resident ^{137}Cs radioactivity measurements. Aspinall et al. (1988), using resident ^{137}Cs radioactivity measured rates of soil loss in excess of 100 t ha^{-1} yr^{-1}, and as high as 133 t ha^{-1} yr^{-1}, on upper slope landscape positions of two Tillage-2000 field sites in Huron County Similar rates of soil loss were observed on upper slope positions of other Tillage-2000 field sites located throughout southwestern Ontario. Kachanoski et al. (1992a) examined the movement of soil within the complex three dimensional landscape of a Brant County field site over the period from 1972 to 1987 using resident ^{137}Cs as a soil tracer. This study indicated that soil losses from shoulder and crest slope landscape positions were greater than 100 t ha^{-1} yr^{-1}. Kachanoski et al. (1992a) determined that the total field scale soil loss was negligible, with concave lower slope areas gaining all of the soil lost from the convex upper slope areas. Based on this observation Kachanoski et al. (1992a) concluded that water erosion was not likely the major process responsible for the soil loss within this, and similar, landscape.

Battiston et al. (1987) estimated that 18 % of the cultivated land in a 90 km^2 area within the Regional Municipality of Waterloo was moderately to severely eroded. Battiston et al. (1987) estimated that 4.5 % of the total area was severely eroded, based on the assumption that the ratio of moderately eroded area to severely eroded area was 3:1. Kachanoski et al. (1992a) estimated that 12.2 % of the field site in Brant Co. was moderately eroded upper slope landscape positions and 4.3 % was severely eroded. The Brant Co. and the Regional Municipality of Waterloo sites are considered representative, in terms of their topography, of the upland regions of

southwestern Ontario. At least 75 % of southwestern Ontario is classified as rolling uplands (Acton pers. comm. 1990).

It is these upper slope landscape positions exhibiting severe soil loss on which major yield reductions occur (Stone et al., 1985; Battiston et al., 1987; Aspinall et al., 1989; Kachanoski et al., 1992d), sometimes yielding no crop, and often producing no net profit. Battiston et al. (1987) observed an average 40 % yield reduction in grain corn production associated with severely eroded upper slope positions. Aspinall et al. (1989) observed up to 50 % crop yield reductions associated with eroded upper slope landscape positions on Tillage-2000 field sites. Yield reductions of 40 to 50 % on 4.3 to 4.5 % of rolling uplands, which constitute at least 75 % of southwestern Ontario's land area, translate into a 1.3 to 1.7 % loss in total crop productivity in southwestern Ontario due to yield reductions on severely eroded upper slope landscape positions alone. These crop yield reductions can be expected to increase as upper slope positions become more severely eroded. An important observation by Battiston et al. (1987) was the non-linear relationship between soil loss and yield reduction. As soil becomes progressively more eroded the rate at which yield decreases increases.

Although severely eroded upper slope landscape positions represent a relatively small proportion of total cultivated field area, the size and distribution of these areas within the field area increases the variability of soil properties, presenting a significant problem in the management of fields for crop production. Daniels et al. (1985) identified that soil erosional patterns in the landscape seemed to be distributed randomly with severe erosion occurring frequently on mid slope and upper slope positions.

In the report, "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" (Kachanoski et al., 1992b), tillage erosion was identified as a major cause of the severe soil loss observed on upper slope landscape position in the complex topography of southwestern Ontario. Tillage erosion is the process of soil loss that results from the translocation of soil by tillage operations. Tillage translocation is the direct movement of soil by tillage implements. Soil loss caused by tillage erosion is measured as the net downslope translocation of

soil. The physical processes of tillage translocation of soil and tillage erosion are discussed in Section 5.3 of the aforementioned report.

Tillage erosion, the net downslope translocation of soil by tillage, was measured by Kachanoski et al. (1992b) on eight shoulder slope landscape positions in two topographically complex field sites, one in Middlesex County, the second in Brant County. The topography of both field sites was considered typical of the upland regions of southwestern Ontario. Cesium-137 was utilized as a labelling element to generate a tracer-pulse for the measurement of soil translocation. Soil translocation was calculated using the synthetic step response distribution synthesized from a succession of convoluted ^{137}Cs pulse response distributions. Paired plots were utilized to compare soil translocation by upslope and downslope tillage.

A single sequence of conventional tillage operations, consisting of fall moldboard plow, and spring tandem disc (double pass) and C-tine cultivator (single pass), translocated upslope (to an extent of 200 cm) approximately 80 kg of soil per meter slope width when tillage was conducted upslope, and translocated downslope (to an extent of 300 cm) 120 kg m^{-1} slope width when tillage was conducted downslope. Therefore, the net downslope soil translocation of two tillage sequences, one upslope and one downslope, was estimated to be approximately 40 kg m^{-1} slope width. Based on the assumption that tillage operations are conducted upslope and downslope equally as often, the rate of net downslope soil translocation was estimated to be approximately 20 kg m^{-1} slope width per tillage sequence. Based on the assumption one sequence of tillage operations occurs per year, the rate of net downslope soil translocation was estimated to be approximately 20 kg m^{-1} slope width per year. The convex slope length between the crest and the position of the plots was approximately 3 m. Based on the assumption that this distance was the source length for the net downslope soil translocation, 20 kg m^{-1} slope width per year represented the total annual soil loss from the 3 m slope length. The average annual soil loss over this convex slope length was estimated to be 6.7 kg m^{-2} yr^{-1}, or 67 t ha^{-1} yr^{-1}, when tillage operations occur upslope equally as often as downslope. For reasons discussed by Kachanoski et al. (1992b), the value of 6.7 kg m^{-2} yr^{-1} is

considered to be a conservative estimate of the average annual soil loss caused by tillage erosion. However, this magnitude of soil loss would account for a significant portion of the soil loss observed on upper slope landscape positions in the complex topography typical of the upland regions of southwestern Ontario.

The implications outlined in the report by Kachanoski et al. (1992b) include: 1) soil loss caused by tillage erosion is not restricted to shoulder slope landscape positions in the upland regions of southwestern Ontario - the process of tillage erosion occurs to some degree on all convex slope positions in all regions with complex topography since the rate at which tillage erosion will occur depends upon the scale and degree of complexity of the topography; 2) the validity of studies of soil loss and soil accumulation which utilize elements such as organic matter content and resident ^{137}Cs radioactivity concentration as indicators of soil redistribution within the landscape are in serious question - soil translocation by tillage can result in changes in the concentration of soil elements at a point in the landscape without changes in the quantity of soil; 3) predictive soil loss and crop productivity models that do not include the process of tillage erosion do not represent reality on cultivated agricultural land in complex topography; and 4) preventative and corrective soil loss measures that do not include the reduction of tillage erosion will not be effective in controlling soil loss on upper slope landscape positions of cultivated agricultural land.

The recommendations for the reduction of tillage erosion outlined in the report by Kachanoski et al. (1992b) include: 1) the reduction in tillage frequency - tillage erosion is directly proportional to the number of tillage operations conducted; 2) the reduction of tillage intensity - soil translocation by tillage is affected by the type of tillage tool and is directly proportional to the depth and speed of tillage operations conducted; 3) the reduction in size of tillage implements - the degree to which a tillage implement planes, or grades, the landscape increases as the dimensions of the fixed frame increase; and 4) the variation of tillage patterns within fields so that all areas within a field are tilled upslope equally as often as downslope to minimize the severity of tillage erosion. Tillage erosion is directly proportional to the degree and scale of topographic complexity, therefore the above recommendations have been strongly

suggested for those areas containing a high concentration of extremely convex landscape positions.

For agricultural and environmental advisors and consultants to provide farm managers with the information to make educated decisions as to which of these recommendations to implement to reduce soil loss by tillage erosion to acceptable levels, it is necessary to examine the effects of tillage implement type, tillage depth and tillage ground speed on the magnitude of soil translocation and net downslope soil translocation by tillage over a range of soil conditions within a range of landscapes. Furthermore, research is needed to validate the findings of Kachanoski et al. (1992b) that tillage erosion is responsible for the severe soil loss occurring on upper slope landscape positions of cultivated land in the complex topography typical of the upland regions of southwestern Ontario.

2.0 OBJECTIVES

The general objective of this study was to examine the processes of tillage translocation and tillage erosion in greater depth. The specific objective was to determine the effect of tillage implement type on the magnitude of soil translocation and net downslope soil translocation by tillage under a range of slope gradients within a typical upland landscape. The effect of other factors such as soil conditions, tillage depth and tillage ground speed were also examined.

The information collected in this study will constitute the major database utilized in the development of a working model to demonstrate the relationship between landscape position, tillage practices, and soil loss. This ongoing study to develop the model has been funded by Agriculture Canada as part of the National Soil Conservation Program.

3.0 MATERIALS AND METHOD

Soil translocation by four tillage implements was measured on a range of slope gradients in both upslope and downslope directions on two topographically complex, but similar, field sites with similar soil conditions. Soil translocation was measured using the tracer-pulse method. Chloride was utilized as the labelling element to generate the tracer-pulse. Soil translocation was calculated using the synthetic step response distribution synthesized from a succession of convoluted Cl pulse response distributions. Soil loss caused by tillage erosion was measured as the net downslope soil translocation by tillage. Paired plots were utilized to determine net downslope soil translocation from upslope and downslope tillage operations. The methods of soil translocation measurement and soil loss measurement caused by tillage erosion are described in Section 5.5 of the report entitled "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b).

3.1 Experimental Design

Two tillage treatments were conducted for each of four tillage implements - chisel plow, moldboard plow, tandem disc, and C-tine cultivator. The two tillage treatments for each of the tillage implements were situated adjacently and conducted in opposing directions. Plots were paired within each pair of tillage treatments, and positioned throughout the length of the tillage treatments. The plots within each pair of treatments were paired to provide measurements of upslope and downslope tillage translocation over the range of slope gradients.

The moldboard plow, tandem disc and C-tine cultivator constitute a conventional tillage system. The operator and tillage implements used were the same as those used in the study "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions". These were chosen to provide comparisons, if possible, between the two studies. The chisel plow was chosen to provide a comparison between a conventional and conservation primary tillage implement.

Soil translocation by the two primary tillage implements, moldboard and chisel plows, was measured in the summer of 1990 on one field site. Soil translocation by the two secondary tillage implements, tandem disc and cultivator, was measured in the summer of 1990 on the second field site. A second field season was necessary because of the extent of the time and manpower involved in executing the field experiments. A second field site was necessary because of the large area with uniform topography required to execute each tillage treatment. Secondary tillage treatments could not be conducted on the location of the primary tillage treatments because of the potential for residual chloride. Both field sites are characterized by sandy loam soil texture, moderately rolling upland topography, and exposed subsoil on upper slope landscape positions. A single large asymmetric ridge traversed the experimental area of the two field sites. A detailed elevation survey was conducted with a laser theodolite at each field site to determine the profile contour for the transect of each tillage treatment, and the position of the plots within each transect. Both field sites had similar cropping and tillage histories in recent years, and had been conventionally tilled in the season prior to the experiment. Estimates of soil loss and accumulation within the two field sites using resident ^{137}Cs radioactivity measurements were not completed upon the submission of this document. The methodologies used in the two field seasons at the two field sites differed somewhat, therefore, the field methodology will be presented in two sections.

3.2 Primary Tillage Treatments, 1990 Field Experiments

Primary tillage treatments were conducted in the summer of 1990 on a farm field site owned by Mervin Lobb in Goderich Twp., Huron County. A single large asymmetric ridge traversed the width of the experimental area. Carbonates observed on the soil surface of the ridge summit indicated that severe soil loss had occurred on the upper slope landscape positions of the experimental area. There were very few stones in the soil but fine gravel tongues were observed in the subsoil at the crest of the ridge. This experimental site was cropped with conventionally tilled soybeans. The soybean crop was removed prior to the tillage treatments. The previous crop was

soybeans.

3.2.1 Experimental Plots

The experimental plots containing the band of tracer were 300 cm in length, 20 cm in width and 25 cm in depth (see Figure 3.1). Plot length was based on an anticipated sample area width of 200 cm. Plot depth was based on the expected maximum depth of tillage of the four tillage implements. Moldboard plow depth was anticipated to be approximately 20 cm. Plot width was based on the volume of labelled soil necessary to produce an easily detected and extensive pulse response distribution, and the minimum width of square mouth shovels, 19 cm. Plot width had to be increased in width from the proposed 15 cm because of shovel width. Each plot was divided into three subplots 100 cm in length for the incorporation of the tracer.

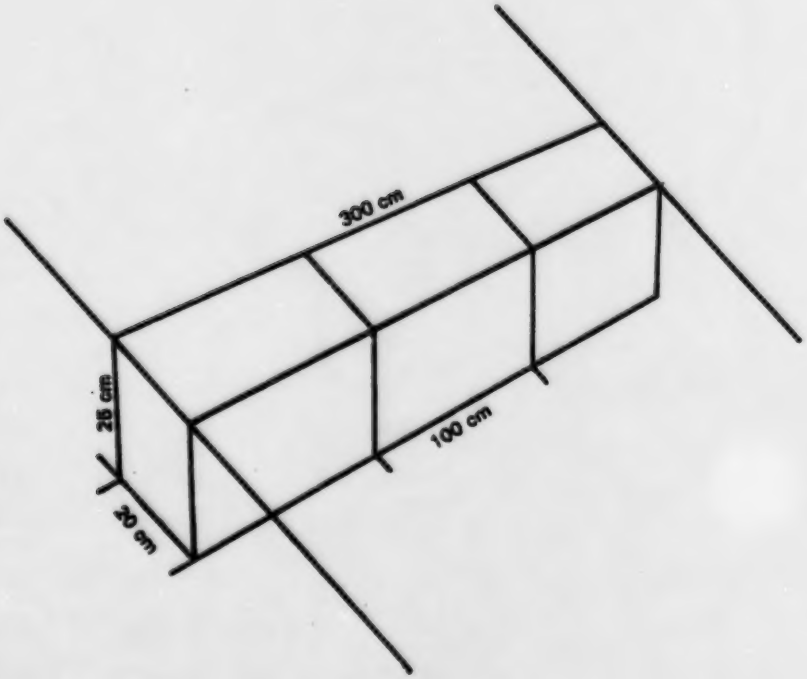


Figure 3.1: Design of plots used to establish tracer-pulse.

To establish the plots, soil was excavated from the immediate plot area. This allowed for the placement of the frame of metal plot walls and subplot partitions. The excavated soil was returned to the plots; then levelled and packed to its original bulk density.

3.2.2 Incorporation of Chloride Tracer

Soil from each subplot was removed in turn and placed in a cement mixer. Solution containing 500 g of greenhouse grade muriate of potash (KCl) was mixed with the soil from each subplot in the cement mixer (237.5 g Cl per metre plot). The chemical analysis of muriate of potash is presented in Appendix A. After thorough mixing the soil labelled with KCl was returned to its respective subplot; then levelled and packed to its original bulk density. This method of incorporation was found to be very time consuming and limited the number of plots established. After incorporation was complete for all subplots of each plot, the plot frame was removed. Measures taken to restrict the mobility of the tracer during the experiment included covering each plot area with a plastic sheet immediately after the incorporation of the tracer. This was done in an effort to restrict the movement of the very soluble Cl within the very permeable sandy soil due to rainfall infiltration and soil water evaporation. Each plastic sheet extended approximately 2 m upslope from the plot and 1 m downslope from the plot. The plastic sheet was weighted down with soil to prevent the sheet from blowing away and to reduce the flow of air under the sheet. A shallow trench, about 20 cm wide and 15 cm deep, was dug upslope from the upper edge of the plastic sheet to divert overland flow to either side of the treatment. The plastic sheets were removed and the diversion trenches were filled in immediately prior to tillage operations. As little water as possible was used to apply the Cl tracer in an effort to minimize leaching from the plot into the surrounding soil. The time between the incorporation of chloride and tillage operations was kept to a minimum to reduce the potential for leaching. Because it was necessary to complete the preparation of all plots within a treatment prior to tillage, some plots were left covered up to 10 days prior to tillage operations.

Baseline sampling of the plots was conducted to assess the extent of the lateral movement of the tracer from the plots. Samples were taken 5 cm upslope and downslope from each plot prior to tillage operations. Analysis of these samples indicated no movement of the tracer upslope or downslope prior to tillage.

A total of ten paired plots were established to compare soil translocation by upslope and downslope moldboard plowing, and ten paired plots to compare soil translocation by upslope and downslope chisel plowing. An additional four paired plots of the chisel plow treatment were located on the same ridge in the adjacent farm field of Robert Thompson. These additional eight plots were eventually excluded from the study due to logistical limitations. The 24 paired plots were positioned throughout the topographic sequence of the ridge which traversed the two adjacent fields (see Figure 2).

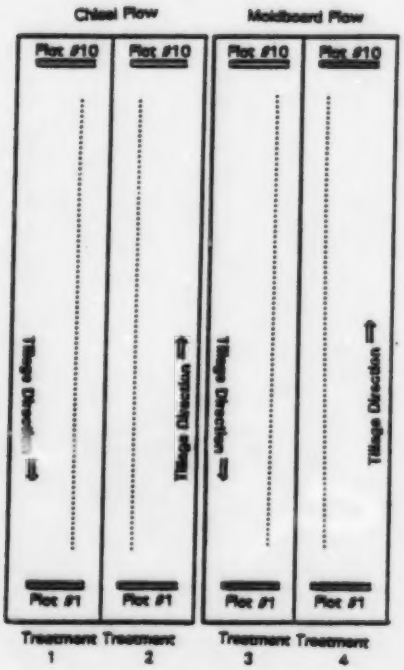


Figure 3.2: Primary tillage field site showing tillage treatments and plot sites.

3.2.3 Tillage Equipment and Operations

Primary tillage equipment consisted of a White model 548 semi-mounted moldboard plow equipped with four 16" 919 high speed bottoms, and an International model 55 chisel plow, 14.5′ working width, equipped with 13" sweeps at 12" spacings. Moldboard plow operations were conducted with a Cockshutt (Oliver) model 1655, 70 horsepower tractor. Chisel plow operations were conducted with a Versatile model 855, 235 horsepower tractor. Moldboard plow tillage operations were conducted by Donald Lobb. Chisel plow tillage operations were conducted by Peter Thompson.

The depth and ground speed of tillage operations were set according to standard implement operating depths and speeds. Moldboard plow depth was set at approximately 15 cm and the ground speed was set at approximately 1.3 m s^{-1} to 1.8 m s^{-1} (3 mph to 4 mph) in a test run at the front of the field. Chisel plow depth was set at approximately 12.5 cm and the ground speed was set at approximately 2.2 m s^{-1} to 2.7 m s^{-1} (5 mph to 6 mph) in a test run at the front of the field.

Chisel plow operations were conducted on treatments 1 and 2. Treatment 1 was tilled from plot 10 to plot 1 (north to south). Treatment 2 was tilled from plot 1 to plot 10 (south to north). Moldboard plow operations were conducted on treatments 3 and 4. Treatment 3 was tilled from plot 10 to plot 1 (north to south). Treatment 4 was tilled from plot 1 to plot 10 (south to north). Primary tillage treatments were conducted in descending order.

Ground speed during tillage was measured with stop watches and distance markers. Although this method was not the most accurate, it provided a good approximation of tillage ground speed. Ground speed was observed to decrease going upslope and increase going downslope; the moldboard plow actually halted ascending the steep side of the ridge. In both moldboard and chisel plow operations the tillage implement had to be raised from its standard operating depth to enable upslope tillage on the steep side of the ridge. Tillage depth and till layer depth after tillage was measure manually with meter sticks. Both ground speed and tillage depth were observed to exceed that recommended for the tillage implements.

3.2.4 Sampling Method

The proposed soil-tracer sampling method was altered. Instead of composite soil probe sampling along 200 cm transects parallel to the plot length, complete excavation of ten 100 cm by 10 cm slices of soil, to the depth of the till layer, was conducted. To facilitate sampling, 1 m by 1 m metal frames were placed into the soil in the area of the plot. To place the frame in the desired position metal posts had been driven into the ground outside the tillage treatments for relocation of the plots. The ten sample slices were taken parallel to each plot from a 100 cm by 100 cm area within the plot area (see Figure 3.3). Plot slices 1 and 2 were located in the position of the plot. The soil from each sample slice was separated into two samples, left and right, weighed and mixed. Two field subsamples weighing approximately 2 kg each, one from each of the left and right samples, were taken for chloride and moisture

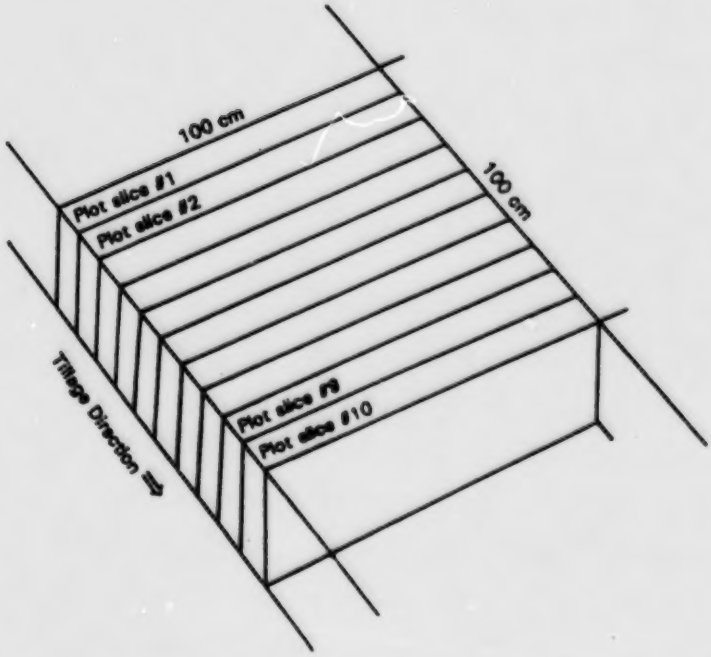


Figure 3.3: Sample area showing plot slices and tillage direction.

content analysis. In the immediate plot area the depth of the sample slices extended below the till layer to the base of the plot - plot depth exceeded tillage depth. An additional sample was taken 10 cm beyond the end of the sample area using the soil probe method. Twenty one samples were taken from the 24 paired plots (48 plots) for a total of 1008 samples for chloride and moisture content analysis.

Following tillage and prior to sampling, measurements of the tillage depth and the till layer depth were made within each plot area. Soil bulk density of the till layer before and after tillage was calculated from the dry soil mass sampled in each plot, the tillage depth, and depth of the till layer after tillage.

It is important to note that an error in the placement of the sampling frame of 1 cm either upslope or downslope could increase or decrease the measured soil translocation by as much as 0.0025 m^3 m^{-1} or 3.5 kg m^{-1}, approximately 10 % of measured values (based on a field soil bulk density of 1400 kg m^{-3}). Relocation of the plots is very critical to the experimental sensitivity when using narrow plots for single tillage operations.

3.2.5 Chemical Analysis of Tracer

Soil moisture content measurements were conducted on a subsample of approximately 35 g (wet weight) from each soil sample taken from the field. A measure of moisture content was necessary to determine the total dry soil mass in each sample slice from the plots. A sample of approximately 5 g from each of the dried soil subsamples was taken and analyzed for chloride content. Chloride was extracted from the soil with water, and the extract analyzed using automated colorimetry (TRAACS 800 ANALYZER), as described by Tel and Heseltine (1990). The accuracy of the data output from the TRAACS 800 ANALYZER was less than reported by Tel and Heseltine (1990) because the equipment located in the Department of Land Resource Science was operated with the incorrect protocol for the duration of the study. The data from the moisture content and chloride analysis are presented in Appendix C, along with a discussion of the protocol used in the analysis and the method of correction.

The presence of carbonates (Ca or Mg) in the soil may inhibit the extraction of Cl from the soil. Chloride may bind with carbonates reducing its solubility in water. This is believed to contribute, to some degree, to less than complete chloride recovery from the plots (see Appendix C).

3.3 Secondary Tillage Treatments, 1991 Field Experiments

Secondary tillage treatments were conducted in the summer of 1991 on a farm field owned by Gordon Lobb in Goderich Twp., Huron County (see Figure 3.4). A single asymmetric ridge traversed the width of the experimental area. A smaller second ridge was situated at the far end of the treatments. Carbonates observed on the soil surface of the ridge summit indicated that soil loss had occurred in the experimental area. This experimental site was cropped with conventionally tilled soybeans. The soybean crop was removed prior to the tillage treatments. The previous crop was soybeans.

Prior to the establishment of the plots on the secondary tillage treatments, the tandem disc treatments were tilled with the moldboard plow, and the cultivator treatments were tilled with both the moldboard plow and tandem disc. These tillage operations were conducted to produce realistic antecedent soil conditions for the secondary tillage treatments. Cultivation was conducted on the tandem disc treatments following their sampling. This additional cultivation provided useful information on tillage operations in addition to the experimental treatments.

3.3.1 Experimental Plots

The reduction in sampling width from 200 cm with the originally proposed composite soil probe sampling method, to 100 cm with the excavation method allowed the plot length to be reduced from 300 cm to 200 cm, consisting of two 100 cm subplots.

Because the treatments were tilled prior to the tillage operations under examination, precautions were required to limit traffic within treatments which would result in compaction causing greater and more variable soil bulk density. The

establishment of the plots and the incorporation of the tracer was conducted on portable scaffolding constructed from milk crates and plywood sheets. This provided a large sturdy platform on which to work and almost eliminated traffic on the treatments.

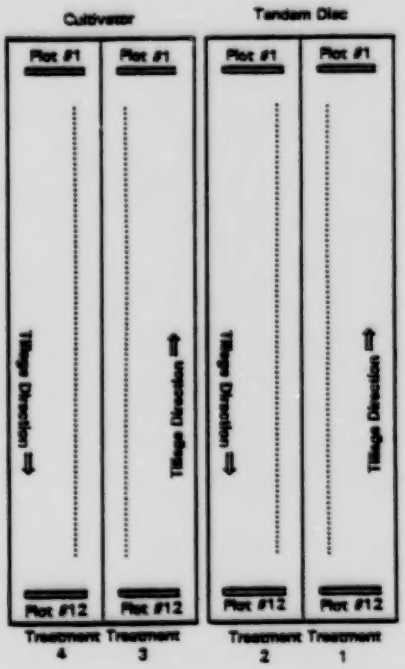


Figure 3.4: Secondary tillage field site showing tillage treatments and plot sites.

3.3.2 Incorporation of Tracer

Chloride was applied in dry powder form to the soil (0.475 kg Cl per metre plot). The tracer was mixed with the soil from each subplot manually in four large pails. This method was found to be quicker, ensured more thorough mixing and eliminated potential problems associated with the addition of water to the soil, when compared to the method used to incorporate the tracer in the previous field season.

A total of twelve paired plots were established to compare soil translocation by upslope and downslope tandem disc tillage, and twelve paired plots to compare soil translocation by upslope and downslope C-tine cultivator tillage.

Baseline sampling was conducted on a subset of plots immediately prior to tillage to assess the extent of horizontal movement of the tracer from the plots and examine the level of Cl concentration within the plots.

Tillage Equipment and Operations

Primary tillage equipment consisted of a Case tandem disc, 14′ cutting width, equipped with 14" diameter disc blades at 7" spacings, and a Glencoe C-tine cultivator, 14′ working width, equipped with narrow 4" sweeps at 7" spacings, and a rear-mounted Buster-bar harrow. Secondary tillage operations were conducted with a Cockshutt (Oliver) model 1655, 70 horsepower tractor. Both tandem disc and C-tine cultivator tillage operations were conducted by Donald Lobb.

The depth and ground speed of tillage operations were set according to standard implement operating depths and speeds. The tandem disc tillage depth was set at approximately 10 cm and the ground speed was set at approximately 0.9 m s^{-1} (2 mph). The cultivator tillage depth was set at approximately 10 cm and the ground speed was set at approximately 1.8 m s^{-1} (4 mph) in test runs on the tandem disc treatments following their sampling.

Tandem disc operations were conducted on treatments 1 and 2. Treatment 1 was tilled from plot 12 to plot 1 (south to north). Treatment 2 was tilled from plot 1 to plot 12 (north to south). Cultivator operations were conducted on treatments 3 and 4. Treatment 3 was tilled from plot 12 to plot 1 (south to north). Treatment 4 was tilled from plot 12 to plot 1 (north to south). Secondary tillage treatments were conducted in ascending order.

Instrumentation was purchased to monitor ground speed and gradient of both the tillage implement and the tractor. Continuous output from two radar guns, mounted on either side of the tractor, one directed forward and one directed to the rear, and two dual axel inclinometers, one mounted on the tractor and one mounted

on the tillage implement, was collected using a data logger. A simple switching system provided markers in the data corresponding to plot positions. This instrumentation is described in Appendix B.

Following tillage and prior to sampling measurements of the till layer depth were made within each plot area. Soil bulk density of the till layer before and after tillage was calculated from the dry soil mass sampled in each plot, the depth of the till layer after tillage, and changes observed in soil bulk density before and after the preceding tillage operations.

3.3.3 Sampling Method

The sampling method and analysis was similar to that described above for the primary tillage experiment. The only deviation was that the two samples taken from each sample slice were not taken from the left and right of the slice sampled, the sample slice was subdivided into top and bottom samples. Twenty samples from the 24 paired plots (48 plots) were collected for a total of 960 samples for chloride and moisture content analysis.

3.3.4 Chemical Analysis of Tracer

Soil moisture content measurements were conducted on a subsample of approximately 35 g (wet weight) of each soil sample taken from the field. A sample of approximately 10 g from each of the dried soil subsamples was taken and analyzed for chloride content. Again, a water extraction of chloride was conducted, and the extract analyzed using automated colorimetry. The data from the moisture content and chloride analysis are found in Appendix C.

One sample from each of the 96 plots will be analyzed for resident ^{137}Cs radioactivity to determine the extent of soil redistribution in both field sites. This information will be used with soil translocation data in future studies of tillage erosion.

3.4 Ground Speed Experiments

At the end of the 1991 field season an additional experiment was conducted to examine the relationship between ground speed and soil translocation by the moldboard plow. The relationship between ground speed and other tillage implements was not conducted due to the lack of time and monies. The moldboard plow was chosen over the chisel plow because the conventional tillage implements are currently of more interest in the examination of soil loss. The moldboard plow was chosen over the secondary tillage implements because of the additional time required to prepare the plots for secondary tillage treatments.

A near-level (< 1°) area of the Mervin Lobb field site was chosen for this experiment. A near-level area was chosen to examine the effect of ground speed without influence from with slope gradient. This experimental site was cropped with no-till soybeans. The soybean crop was removed prior to tillage. The previous crop was conventionally tilled soybeans. The method of tracer incorporation was that used in Section 3.3. The tillage equipment and operator was that used in Section 3.2. Three adjacent ground speed treatments were conducted. Three replicate plots were located within each treatment. The three plots within each treatment were positioned end-to-end with the plots in adjacent treatments. The position of the three sets of plots were marked using a single pair of posts, one at each side of the three treatments. The ground speeds chosen, 0.97 m s^{-1} (2.17 mph), 1.54 m s^{-1} (3.44 mph), and 2.06 m s^{-1} (4.61 mph), spanned the range of moldboard plow ground speed under normal field operating conditions. The method of sampling and tracer analysis was that used in Section 3.3. The field average soil bulk density was 1619 kg m^{-3}. The average tillage depth was approximately 23 cm.

4.0 RESULTS AND DISCUSSION

4.1 Soil Properties

The two soil physical properties measured in this study were soil moisture content and soil bulk density. The conversion of soil volume translocation measurements to soil mass translocation requires soil bulk density measurements. If a field averaged soil bulk density is used for the conversion the translocation measurements simply change units from m^3 m^{-1} to kg m^{-1}. However, if a pattern in soil bulk density exists it should affect the soil translocation results non-uniformly. Although the values of bulk density, measured at each plot, were highly variable throughout the treatments, a pattern was apparent (see Figures 4.1 through 4.3). Soil bulk density was generally higher on the eroded upper slope positions. Before the values of soil volume translocation were converted to soil mass translocation a simple smoothing operation was conducted on the soil bulk density data to generate representative soil bulk densities averaged across the treatments, varying along the length of the treatments which traversed the profile of the ridges. The smoothed soil bulk density data are shown in Figures 4.1c, 4.2b and 4.3b. Soil bulk density values used for the conversion are given in Tables 4.1 through 4.4. Field averaged soil bulk density prior to tillage treatments on the primary tillage site was 1627 kg m^3, ranging from 1453 kg m^3 to 1784 kg m^3. Prior to tillage treatments, field averaged soil bulk densities on the secondary tillage site were 1089 kg m^3, ranging from 1058 kg m^3 to 1133 kg m^3, on the tandem disc treatments; and 1156 kg m^3, ranging from 1123 kg m^3 to 1203 kg m^3, on the cultivator treatments.

Measurements of gravimetric soil moisture content were used to determine the content of the Cl tracer per unit dry soil mass and the total dry soil mass of each plot slice sampled. Soil moisture content data are presented in Appendix C. In general, the moisture content was variable but displayed trends. Soil moisture content increased from the eroded upper slope landscape positions to lower slope landscape positions, and increased with depth from surface. Soil moisture content ranged from 2 % to 20 %.

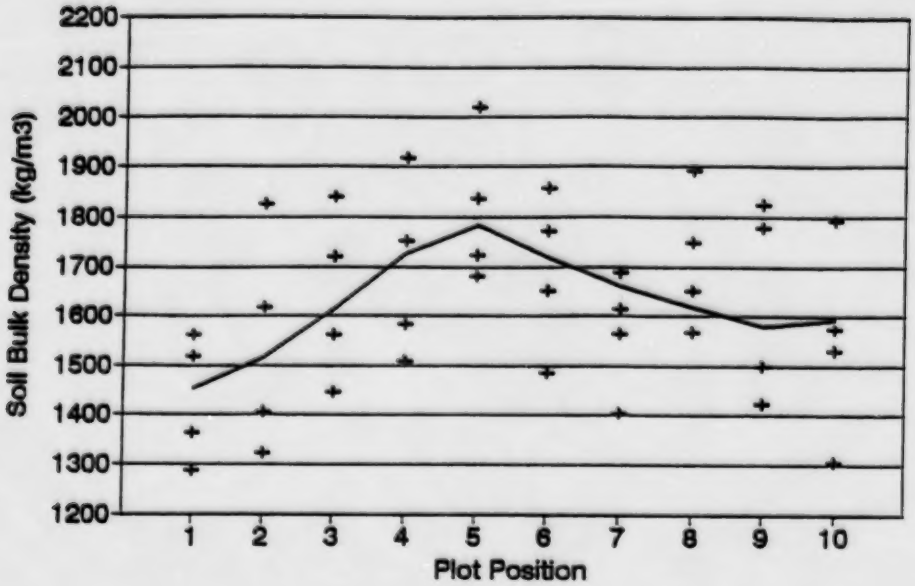


Figure 4.1a: Field soil bulk density before primary tillage treatments, M. Lobb field site. Soil bulk density was calculated from tillage depth and sample mass of the till layer at plot sites. The field soil bulk density used to calculate soil mass translocation is indicated with a solid line.

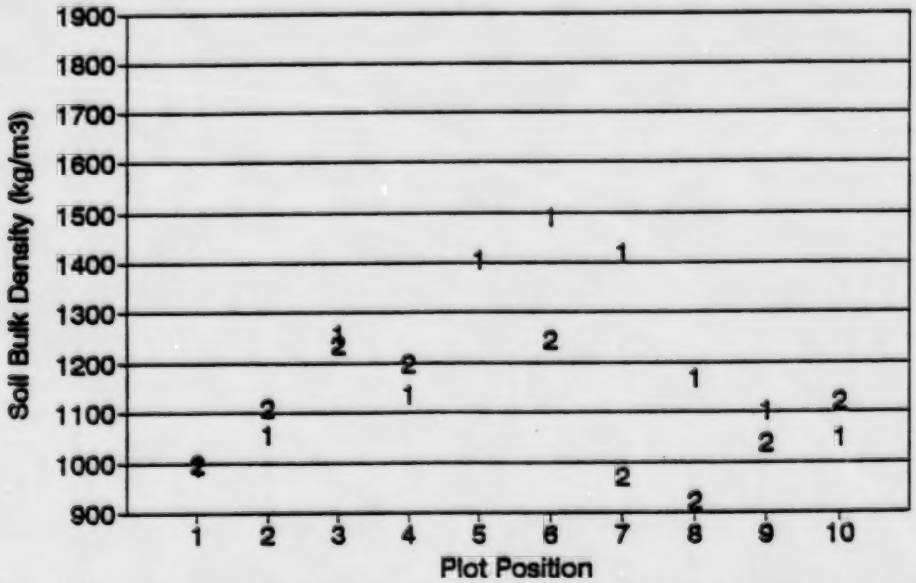


Figure 4.1b: Field soil bulk density after chisel plow treatments, M. Lobb field site. Soil bulk density was calculated from till layer depth and sample mass of the till layer at plot sites. Treatments 1 and 2 are indicated with markers.

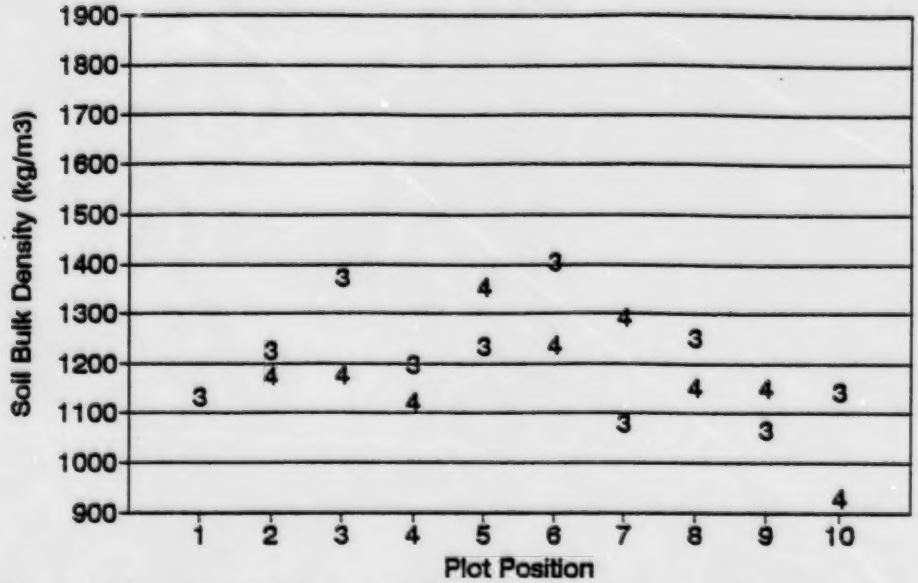


Figure 4.1c: Field soil bulk density after moldboard plow treatments, M. Lobb field site. Soil bulk density was calculated from till layer depth and sample mass of the till layer at plot sites. Treatments 3 and 4 are indicated with markers.

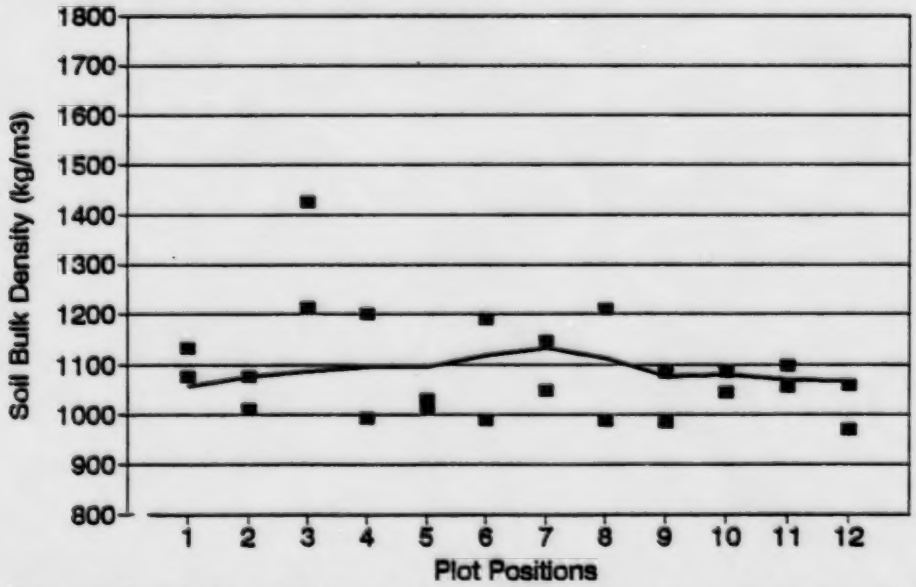


Figure 4.2a: Field soil bulk density before tandem disc treatments, G. Lobb field site. Soil bulk density was calculated from till layer depth, sample mass of the till layer at plot sites, soil bulk density measurements before primary tillage operations and an estimation of fluffing by primary tillage. The field soil bulk density used to calculate soil mass translocation is indicated with a solid line.

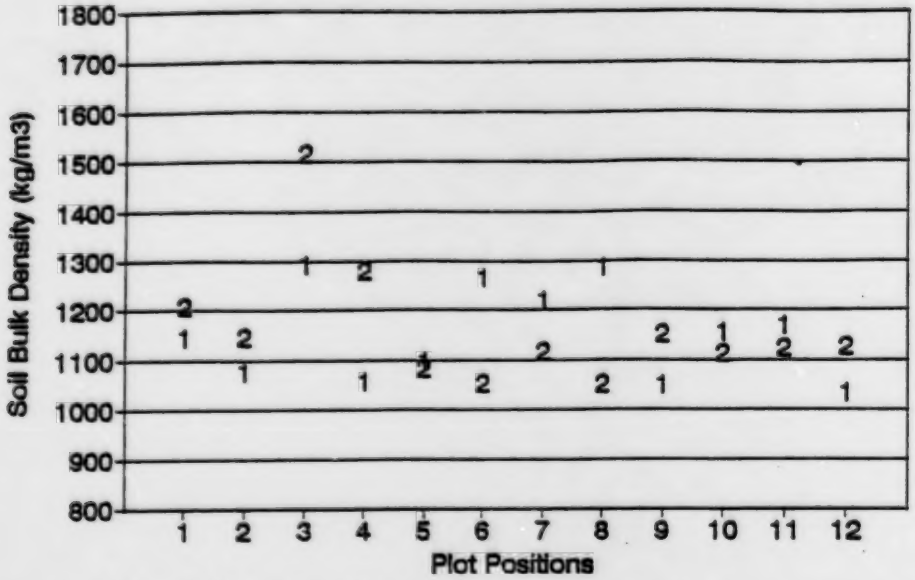


Figure 4.2b: Field soil bulk density after tandem disc treatments, G. Lobb field site. Soil bulk density was calculated from till layer depth and sample mass of the till layer at plot sites. Treatments 1 and 2 are indicated with markers.

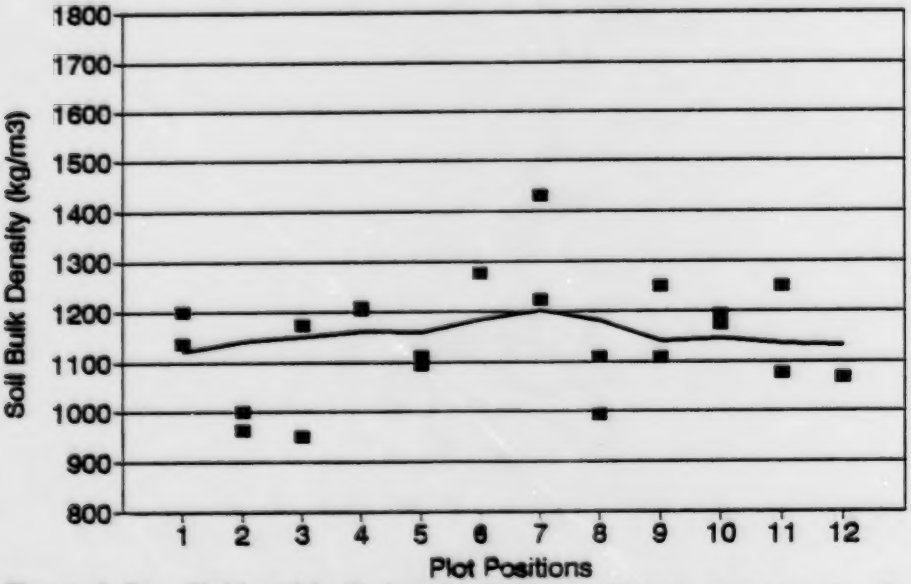


Figure 4.3a: Field soil bulk density before cultivator treatments, G. Lobb field site. Soil bulk density was calculated from till layer depth, sample mass of the till layer at plot sites, and soil bulk density measurements after tandem disc operations in the adjacent treatments. The field soil bulk density used to calculate soil mass translocation is indicated with a solid line.

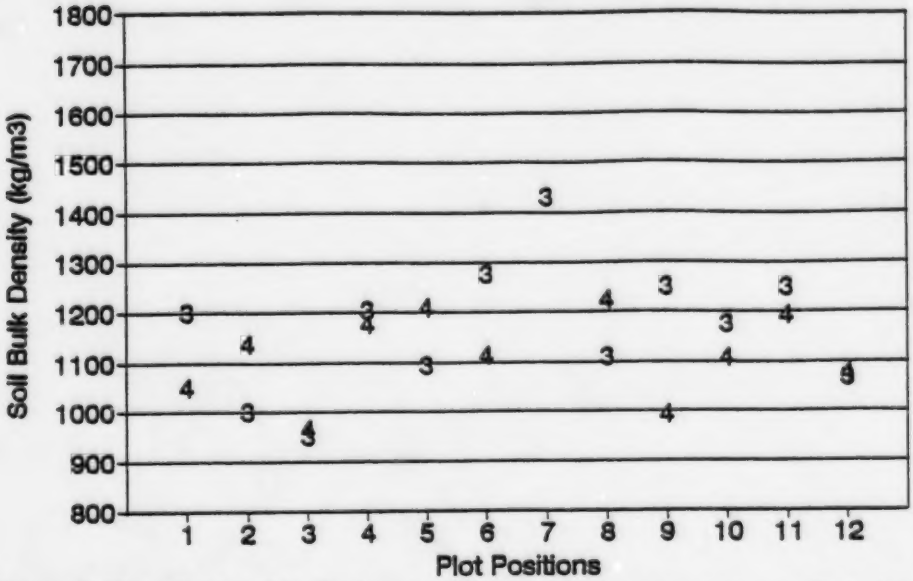
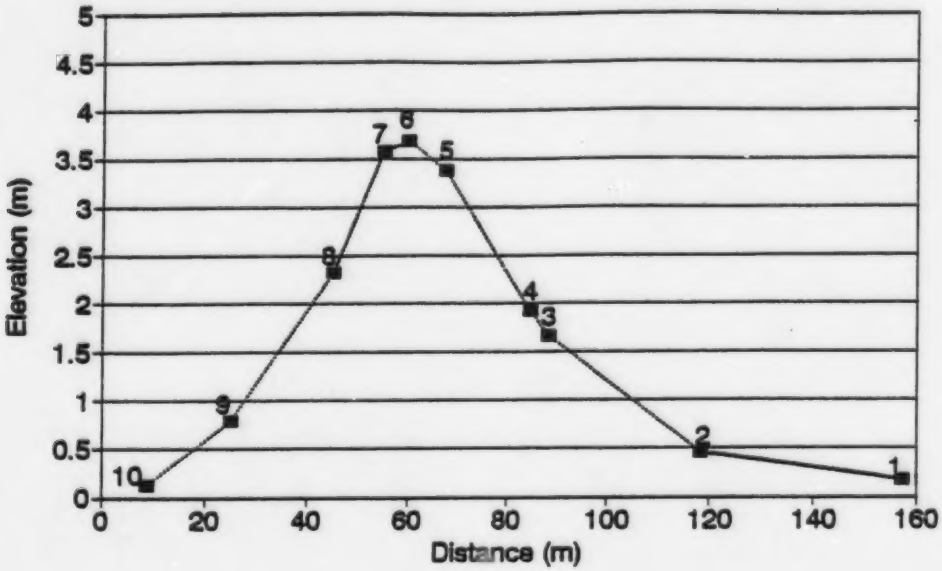


Figure 4.3b: Field soil bulk density after cultivator treatments, G. Lobb field site. Soil bulk density was calculated from till layer depth and sample mass of the till layer at plot sites. Treatments 3 and 4 are indicated with markers.

4.2 Landscape Topography

Elevation surveys were conducted at the field sites to quantify distance between plots, slope gradient, profile and plan curvature for use in future tillage erosion studies where detailed landform characterization is necessary. For this study only slope gradient and distance between plots was required for the analysis of the results. Figures 4.4 through 4.7 illustrate the slope profiles of the eight tillage treatments. The slope gradients at each plot site are presented in Table 4.1. The topography of all treatments was similar consisting of an asymmetric ridge with slope gradients of 6.5° to 8.5° (11.4 % to 14.9 %) on the steep slope face and 3.0° to 5.0° (5.2 % to 8.7 %) on the opposing slope face. Based on visual observations plot sites were classified as convex upper slope (CU), linear backslope (LB), linear lower slope (LL), and concave lower slope (CL) landscape positions. Primary tillage plots 1, 2 and 10 were classed as LL, plots 3, 4, 8 and 9 as LB, and plots 5, 6 and 7 as CU. Secondary tillage plot 1 was classed as LL, plots 2, 3, 7, 8 and 11 as LB, plots 4, 5, 6 and 12 as CU, plots 9 and 10 as CL.

a)



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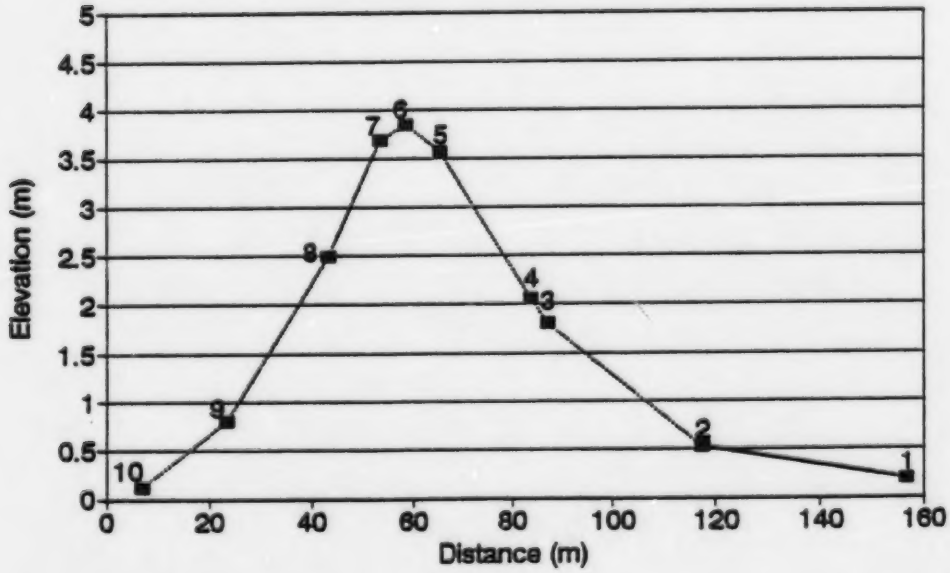
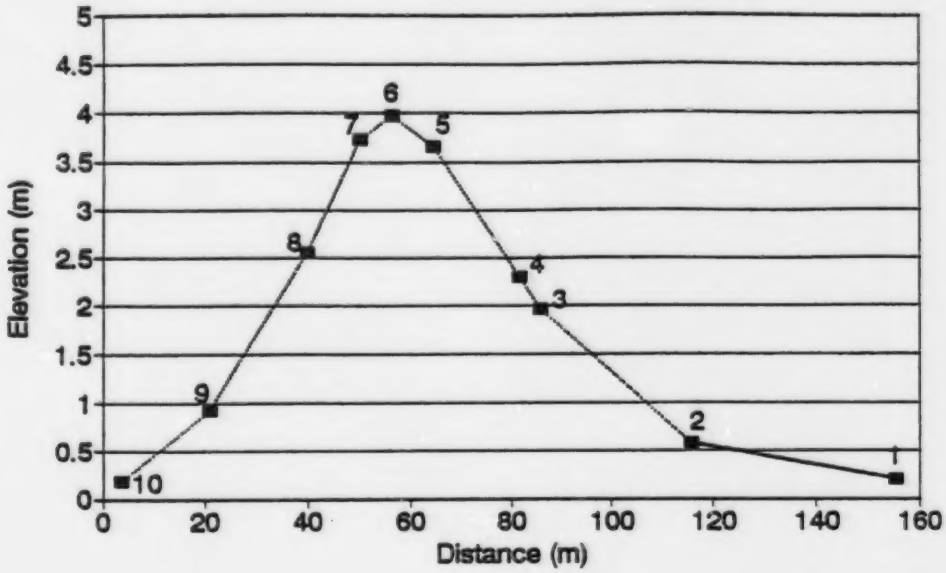


Figure 4.4: Slope profile of chisel plow treatments, M. Lobb field site. a) Treatment 1. b) Treatment 2.

a)



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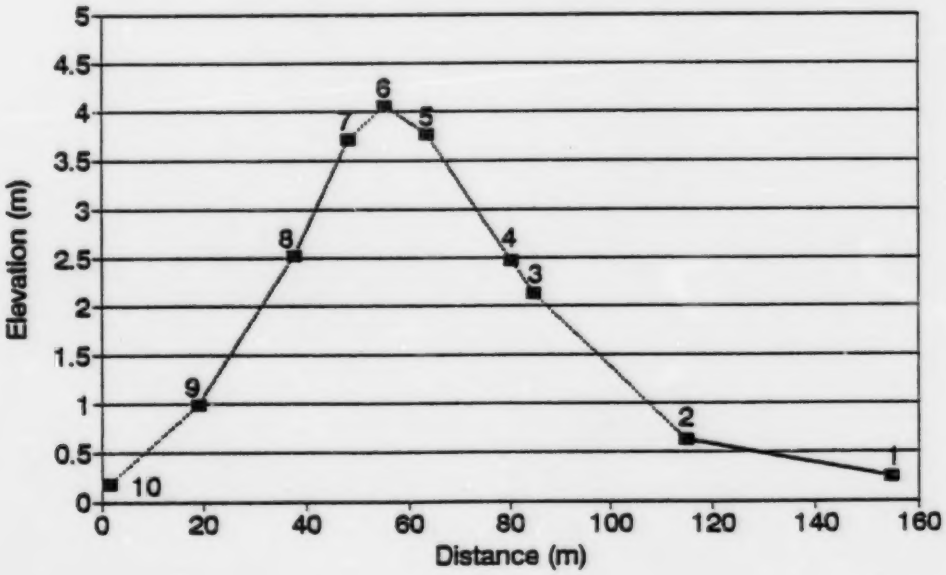
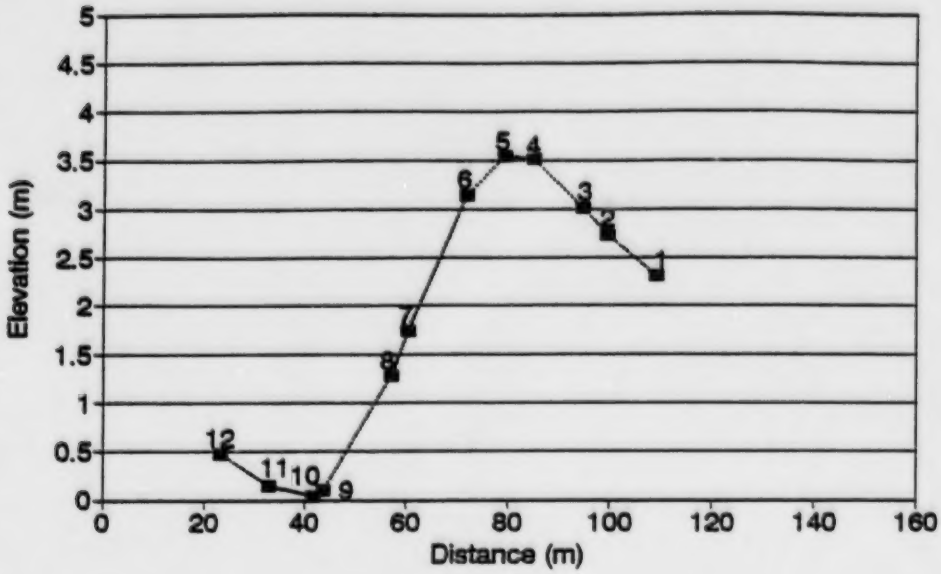


Figure 4.5: Slope profile of moldboard plow treatments, M. Lobb field site. a) Treatment 3. b) Treatment 4.

a)



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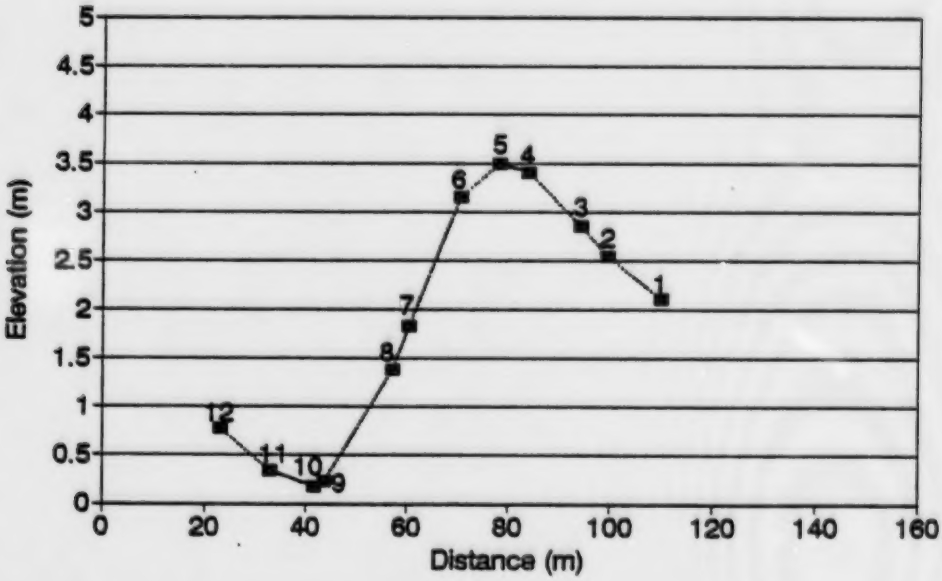
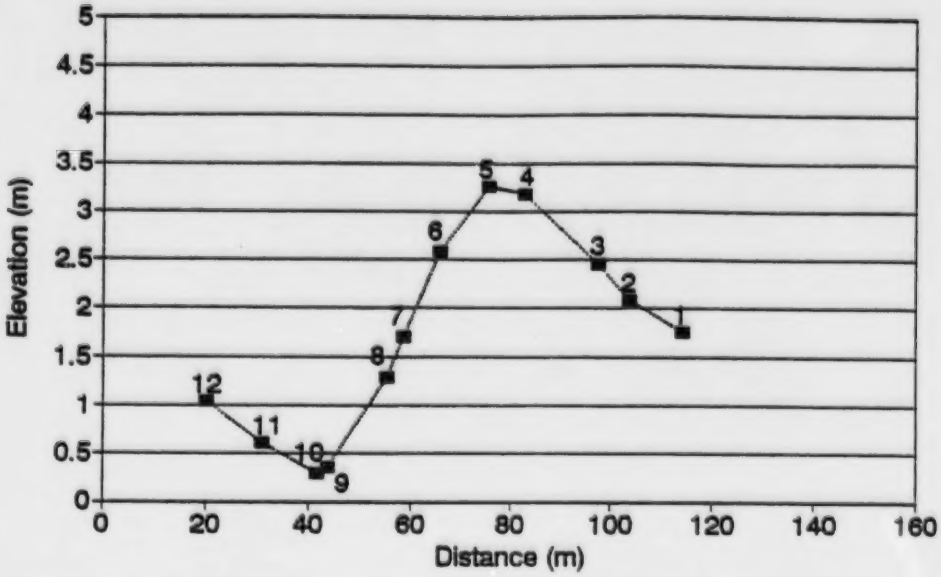


Figure 4.6: Slope profile of tandem disc treatments, G. Lobb field site. a) Treatment 1. b) Treatment 2.

a)



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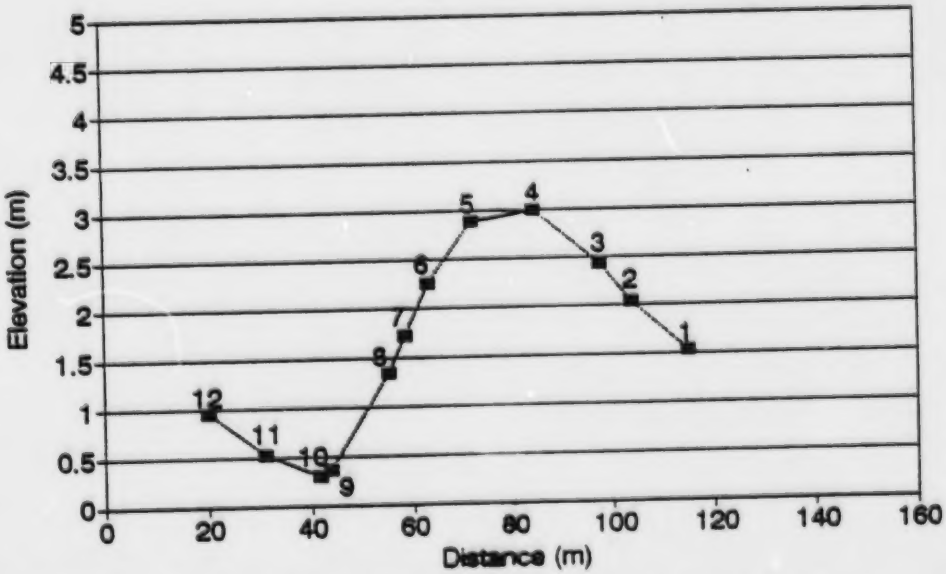

Figure 4.7: Slope profile of cultivator treatments, G. Lobb field site. a) Treatment 3. b) Treatment 4.

4.3 Soil Translocation

Measurements of soil translocation were calculated using the tracer-pulse method described in "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b). Soil translocation was calculated as the mass, converted from the translocated volume, of unlabelled soil translocated past the upslope face of the plots tilled downslope and past the downslope face of the plots tilled upslope. The quantity of soil translocated at a plot was calculated using the synthetic step response distribution (SSRD) which was synthesized from a succession of Cl pulse response distributions (PRD), each identical to the measured pulse response distribution for that plot. The pulse response distributions and synthetic step response distributions used in the calculation of soil translocation are given in Appendix C. Both the soil volume and soil mass translocation measurements are presented in Tables 4.1 through 4.4 and illustrated in Figures 4.8 through 4.11.

Soil translocation measurements were highly variable for each tillage implement, both between tillage treatments of tillage implements and within tillage treatments. However, some evidence of trends was observed in the results, particularly when examined within tillage treatments. There was a tendency to translocate less soil up the slope faces to the crests, and translocate more soil from the crests down the slope faces.

Plot 1 of chisel plow treatment 1 appears to be an experimental outlier. Upon examination it appeared that the order of the samples taken in the field may have been reversed for this plot. Plot 7 of cultivator treatment 4 was improperly sampled. These plots were not included in the statistical analysis below.

All four tillage implements translocated a large amount of soil. Maximum values of soil translocation exceeded 50 kg m^{-1} for both primary tillage implements and 30 kg m^{-1} for both secondary tillage implements. Minimum and maximum values of soil translocation by each tillage implement were 16.6 kg and 50.2 kg per meter slope width for the chisel plow, a range of 33.6 kg m^{-1}; 20.5 kg m^{-1} and 59.0 kg m^{-1} for the moldboard plow, a range of 38.5 kg m^{-1}; 9.2 kg m^{-1} and 36.1 kg m^{-1} for the tandem

disc, a range of 26.9 kg m^{-1}; and 19.8 kg m^{-1} and 39.8 kg m^{-1} for the cultivator, a range of 20 kg m^{-1}. Minimum values occurred during upslope tillage and maximum values occurred during downslope tillage. The range in the amount of soil translocated by a tillage implement may be interpreted as an indicator of the potential for net downslope translocation, tillage erosion, by that tillage implement.

Table 4.1: Chisel Plow Field Data and Soil Translocation Measurements

Treatment Plot	Slope Gradient (°)*	Downslope Gradient w.r.t. Tillage Direction	Bulk Density Before Tillage (kg m^{-3})	Tillage Ground Speed (m s^{-1})	Tillage Depth (cm)	Till Layer Depth (cm)	Bulk Density After Tillage (kg m^{-3})	Soil Volume Translocated (m^3 m^{-1})	Soil Mass Translocated (kg m^{-1})
1 1 ↑	0.2	-0.2	1453	2.56	17.5	23.8	992	0.019	27.4
1 2 ↑	0.5	0.5	1516	2.56	18.1	24.7	1054	0.011	16.6
1 3 ↑	3.5	3.5	1615	3.33	17.6	23.9	1256	0.016	26.6
1 4 ↑	4.2	4.2	1727	3.33	18.7	25.5	1137	0.019	33.4
1 5 ↑	3.8	3.8	1784	2.44	16.6	22.6	1404	0.028	50.2
1 6 ↑	0.5	0.5	1720	2.22	15.4	20.9	1490	0.020	33.6
1 7 ↑	3.1	-3.1	1660	2.00	14.2	19.4	1419	0.018	29.8
1 8 ↑	7.1	-7.1	1617	2.54	17.2	23.4	1168	0.016	26.5
1 9 ↑	2.8	-2.8	1579	2.54	17.3	23.6	1102	0.018	28.9
1 10 ↑	2.4	-2.4	1595	2.51	14.8	20.1	1050	0.021	33.3
2 1 ↓	0.2	0.2	1453	2.55	17.0	23.2	999	0.068	98.8
2 2 ↓	0.5	-0.5	1516	2.84	17.9	24.4	1108	0.020	30.0
2 3 ↓	3.6	-3.6	1615	2.56	15.9	21.6	1236	0.011	17.6
2 4 ↓	4.2	-4.2	1727	2.56	14.0	19.1	1197	0.011	19.7
2 5 ↓	3.5	-3.5	1784	2.81	13.8	18.8	1978	0.011	19.8
2 6 ↓	0.3	-0.3	1720	3.02	14.6	19.9	1243	0.016	27.2
2 7 ↓	4.0	4.0	1660	3.33	19.3	26.3	971	0.021	34.1
2 8 ↓	6.8	6.8	1617	2.50	19.0	25.9	923	0.018	29.7
2 9 ↓	2.6	2.6	1579	2.50	19.5	26.5	1037	0.020	32.3
2 10 ↓	2.3	2.3	1595	2.51	18.7	25.5	1122	0.016	24.6

↑ and ↓ denote direction of tillage relative to adjacent plots.
* 1° ≈ 1.75%

In comparing the data for each tillage implement on the seven plots positioned on the upper slope landscape positions of the ridge, it was observed that the chisel plow, operating at an average depth of 16.7 cm and ground speed of 2.69 m s^{-1} (6.02 mph), translocated 29.2 kg m^{-1} ± 8.1 kg m^{-1} (± one sample standard deviation); the moldboard plow, operating at an average tillage depth of 22.5 cm and ground speed

Table 4.2: Moldboard Plow Field Data and Soil Translocation Measurements

Treatment Plot	Slope Gradient (%)*	Downslope Gradient w.r.t. Tillage Direction	Bulk Density Before Tillage (kg m^{-3})	Tillage Ground Speed (m s^{-1})	Tillage Depth (cm)	Till Layer Depth (cm)	Bulk Density After Tillage (kg m^{-3})	Soil Volume Translocated (m^3 m^{-1})	Soil Mass Translocated (kg m^{-1})
3 1 ↑	0.3	0.3	1453	1.80	18.3	24.6	1131	0.020	28.7
3 2 ↑	0.6	0.6	1516	1.81	20.2	21.8	1225	0.022	33.3
3 3 ↑	4.2	4.2	1615	1.83	20.3	27.2	1372	0.028	42.6
3 4 ↑	4.4	4.4	1727	1.76	20.3	29.7	1198	0.026	45.3
3 5 ↑	3.2	3.2	1784	1.76	22.0	[illegible]	1233	0.033	59.0
3 6 ↑	0.1	0.1	1720	1.60	26.6	33.6	1404	0.032	55.0
3 7 ↑	4.6	-4.6	1660	1.43	26.6	34.7	1078	0.031	51.6
3 8 ↑	6.4	-6.4	1617	1.40	21.6	32.6	1253	0.015	24.7
3 9 ↑	2.6	-2.6	1579	1.60	24.0	33.9	1063	0.032	50.8
3 10 ↑	2.4	-2.4	1595	1.68	23.0	30.8	1142	0.021	33.7
4 1 ↓	0.3	-0.3	1453	1.79	20.2	26.9	1174	0.014	20.5
4 2 ↓	0.8	-0.8	1516	1.80	22.2	26.6	1176	0.014	21.0
4 3 ↓	4.0	-4.0	1615	1.77	21.0	27.1	1121	0.017	28.1
4 4 ↓	4.8	-4.8	1727	1.77	20.6	29.2	1354	0.027	46.6
4 5 ↓	3.2	-3.2	1784	1.59	20.6	28.0	1234	0.028	47.1
4 6 ↓	0.1	0.1	1720	1.63	23.2	33.4	1292	0.023	39.5
4 7 ↓	5.0	5.0	1660	1.67	23.0	33.8	1150	0.032	53.3
4 8 ↓	6.5	6.5	1617	2.05	23.4	31.9	1149	0.028	42.4
4 9 ↓	2.8	2.8	1579	1.83	21.8	33.4	928	0.025	39.7
4 10 ↓	2.0	2.0	1595	1.59	23.0	32.3	1278	0.025	38.1

↑ and ↓ denote direction of tillage relative to adjacent plots.
* 1° = 1.75%

Table 4.3: Tandem Disc Field Data and Soil Translocation Measurements

Treatment Plot	Slope Gradient (°)*	Downslope Gradient w.r.t. Tillage Direction	Bulk Density Before Tillage (kg m^{-3})	Tillage Ground Speed (m s^{-1})	Till Layer Depth (cm)	Bulk Density After Tillage (kg m^{-3})	Soil Volume Translocated (m^3 m^{-1})	Soil Mass Translocated (kg m^{-1})
1 1 ↑	0.9	0.9	1058	0.87	24.6	1144	0.022	23.0
1 2 ↑	3.4	3.4	1077	0.98	20.5	1076	0.028	30.4
1 3 ↑	3.2	3.2	1086	0.98	18.0	1291	0.027	29.1
1 4 ↑	1.0	1.0	1095	0.93	27.9	1057	0.020	21.6
1 5 ↑	1.0	-1.0	1094	0.93	25.8	1096	0.018	19.5
1 6 ↑	6.1	-6.1	1116	0.77	24.6	1266	0.009	10.3
1 7 ↑	7.0	-7.0	1133	0.46	27.1	1220	0.009	10.6
1 8 ↑	6.2	-6.2	1112	0.48	25.5	1288	0.008	9.2
1 9 ↑	3.3	-3.3	1075	0.87	24.0	1049	0.019	20.8
1 10 ↑	2.5	-2.5	1080	0.87	24.0	1154	0.017	18.9
1 11 ↑	2.7	2.7	1069	0.93	25.2	1162	0.028	29.9
1 12 ↑	1.2	1.2	1067	0.87	29.6	1033	0.025	26.9
2 1 ↓	1.1	-1.1	1058	0.82	24.7	1207	0.023	24.2
2 2 ↓	3.3	-3.3	1077	0.87	22.9	1146	0.021	22.5
2 3 ↓	3.6	-3.6	1086	0.82	18.0	1518	0.021	23.0
2 4 ↓	2.8	-2.8	1095	0.77	24.4	1279	0.025	27.2
2 5 ↓	0.5	0.5	1094	0.87	26.6	1083	0.029	31.5
2 6 ↓	5.8	5.8	1116	0.93	26.2	1052	0.029	32.9
2 7 ↓	7.0	7.0	1133	0.98	22.9	1115	0.031	34.9
2 8 ↓	5.0	5.0	1112	1.03	26.7	1051	0.032	36.1
2 9 ↓	1.9	1.9	1075	0.98	24.0	1151	0.028	29.7
2 10 ↓	0.6	0.6	1080	0.96	25.7	1112	0.021	22.5
2 11 ↓	3.6	-3.6	1069	0.62	25.7	1123	0.031	33.3
2 12 ↓	0.1	-0.1	1067	0.62	25.3	1127	0.027	28.4

↑ and ↓ denote direction of tillage relative to adjacent plots.

* 1° = 1.75%

1 ms^{-1} = 3.6 kph

Table 4.4: Cultivator Field Data and Soil Translocation Measurements

Treatment Plot	Slope Gradient (°)*	Downslope Gradient w.r.t. Tillage Direction	Bulk Density Before Tillage (kg m⁻³)	Tillage Ground Speed (m s⁻¹)	Till Layer Depth (cm)	Bulk Density After Tillage (kg m⁻³)	Soil Volume Translocated (m³ m⁻¹)	Soil Mass Translocated (kg m⁻¹)
3 1 ↑	0.7	0.7	1123	1.86	25.7	1201	0.030	34.2
3 2 ↑	3.7	3.7	1143	2.16	24.6	1001	0.035	39.8
3 3 ↑	3.6	3.5	1153	2.06	26.6	961	0.021	23.9
3 4 ↑	2.4	2.4	1163	2.21	23.7	1206	0.022	25.6
3 5 ↑	1.0	-1.0	1161	2.11	26.2	1093	0.022	25.3
3 6 ↑	5.9	-5.8	1187	1.23	26.5	1276	0.021	25.4
3 7 ↑	8.6	-8.6	1203	1.13	25.4	1431	0.025	30.2
3 8 ↑	7.9	-7.9	1181	1.39	25.9	1109	0.023	26.6
3 9 ↑	2.2	-2.2	1141	1.80	23.0	1250	0.030	34.7
3 10 ↑	1.4	-1.4	1147	1.70	26.0	1175	0.027	31.4
3 11 ↑	3.1	3.1	1135	1.90	23.9	1248	0.030	33.6
3 12 ↑	0.0	0.0	1132	1.95	27.0	1067	0.025	26.7
4 1 ↓	1.6	-1.6	1123	2.21	25.0	1049	0.026	29.3
4 2 ↓	3.6	-3.6	1143	2.00	25.0	1137	0.022	25.1
4 3 ↓	4.0	-4.0	1153	2.06	31.3	965	0.021	24.1
4 4 ↓	1.9	-1.9	1163	1.90	26.4	1175	0.022	25.6
4 5 ↓	0.1	-0.1	1161	2.31	24.9	1209	0.023	26.4
4 6 ↓	4.6	4.6	1187	1.90	28.8	1113	0.017	19.9
4 7 ↓	7.2	7.2	1203	2.21	26.5	●	●	●
4 8 ↓	7.3	7.3	1181	2.31	25.9	1225	0.029	34.8
4 9 ↓	1.7	1.7	1141	2.00	27.7	994	0.023	25.9
4 10 ↓	0.9	0.9	1147	1.90	26.2	1108	0.020	22.8
4 11 ↓	2.6	-2.6	1135	1.70	26.9	1194	0.030	34.1
4 12 ↓	0.1	0.1	1132	2.06	29.1	1077	0.019	21.9

↑ and ↓ denote direction of tillage relative to adjacent plots
* 1° = 1.75%
● improperly sampled
1 ms⁻¹ = 3.6 kph

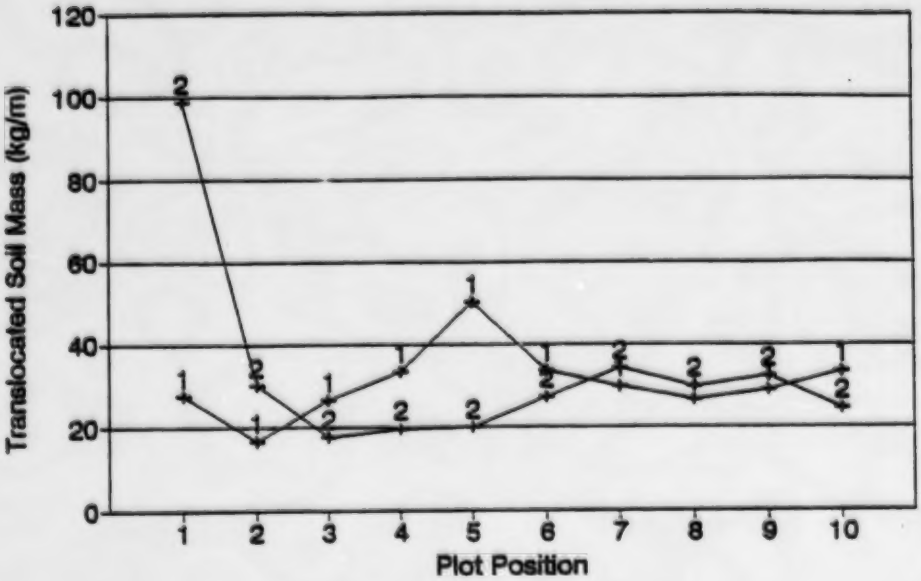

Figure 4.8: Soil translocation by chisel plow. Treatments 1 and 2 indicated with markers.

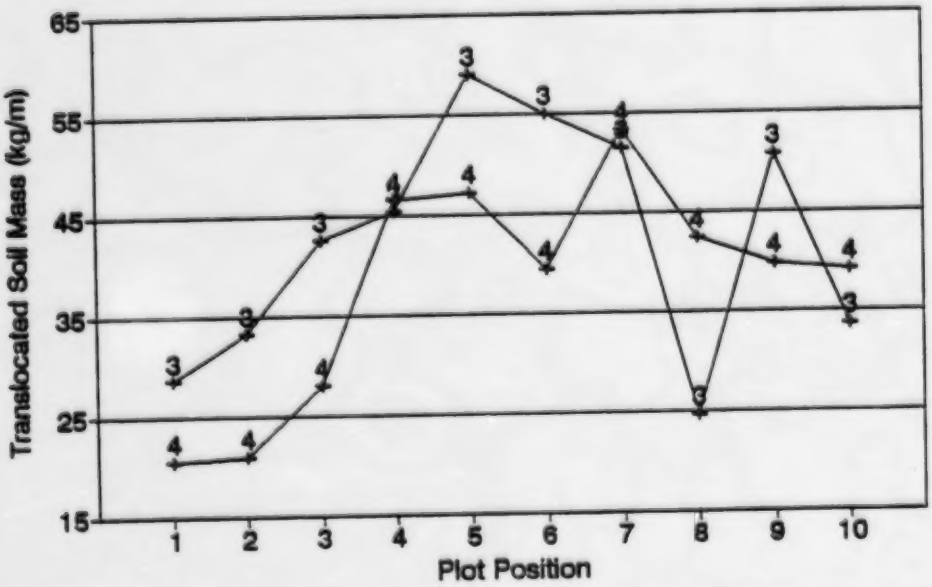

Figure 4.9: Soil translocation by moldboard plow. Treatments 3 and 4 indicated with markers.

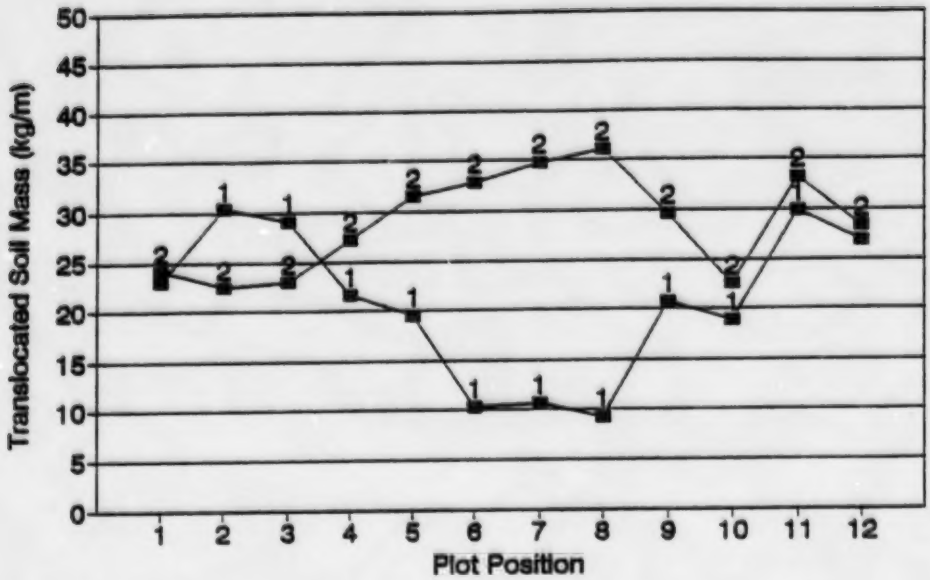

Figure 4.10: Soil translocation by tandem disc. Treatments 1 and 2 indicated with markers.

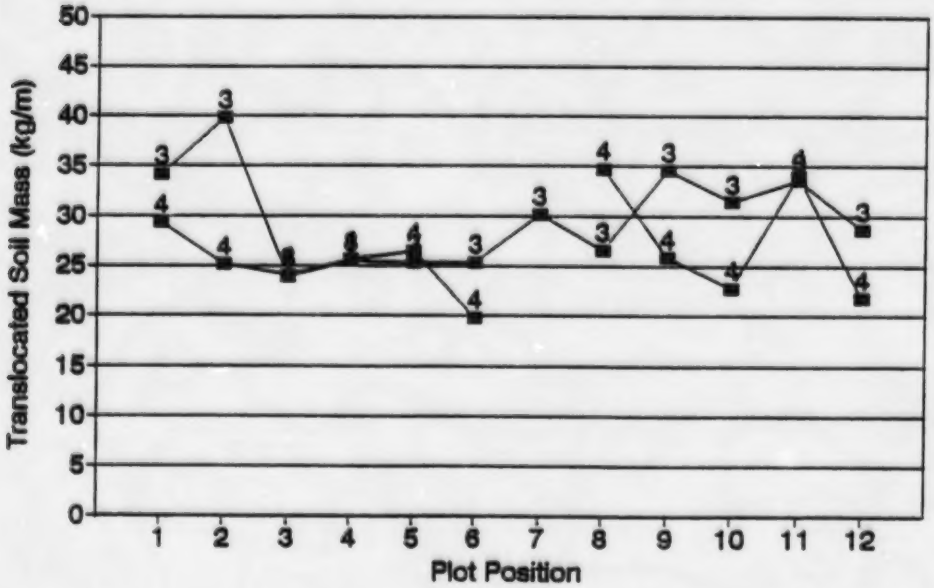

Figure 4.11: Soil translocation by cultivator. Treatments 3 and 4 indicated with markers.

of 1.69 m s^{-1} (3.78 mph), translocated 44.7 kg m^{-1} ± 9.7 kg m^{-1}; the tandem disc, operating at an average ground speed of 0.84 m s^{-1} (1.88 mph), translocated 24.2 kg m^{-1} ± 9.2 kg m^{-1}; and the cultivator, operating at an average ground speed of 1.93 m s^{-1} (4.32 mph), translocated 27.1 kg m^{-1} ± 5.2 kg m^{-1}. The operating tillage depth of both the tandem disc and the cultivator could not be measured directly but was expected to be approximately equal. These results suggest that a factor other than slope gradient and ground speed, such as tillage tool shape and arrangement, affected the amount of soil translocated for secondary tillage treatments.

4.4 Net Downslope Soil Translocation

The measurements of tillage erosion calculated as the net downslope soil translocation at paired plot positions are presented in Table 4.5 and illustrated in Figures 4.12 through 4.15. The results were highly variable, with no evidence of trends in net downslope soil translocation observed.

In comparing the data for each tillage implement on the seven plots positioned on the upper slope landscape positions of the ridge it was observed that the net downslope translocation measured at paired plot positions was an average 10.1 kg per metre slope width for the chisel plow, ranging from 3.2 kg m^{-1} to 30.4 kg m^{-1}, 2.6 kg m^{-1} for the moldboard plow, ranging from -15.5 kg m^{-1} (net upslope translocation) to 17.8 kg m^{-1}; 13.4 kg m^{-1} for the tandem disc, ranging from -5.6 kg m^{-1} to 26.9 kg m^{-1}; 2.6 kg m^{-1} for the cultivator, ranging from -5.5 kg m^{-1} to 14.6 kg m^{-1}. The maximum absolute values of net downslope translocation, 30.4 kg m^{-1}, 17.8 kg m^{-1}, 26.9 kg m^{-1}, 14.6 kg m^{-1} for the chisel plow, moldboard plow, tandem disc, and cultivator, respectively, may be interpreted as an indicators of the potential soil loss from upper slope landscape positions. Net upslope translocation of soil is evidence of the variability in operating conditions between treatments of tillage implements, resulting in greater upslope translocation at a plot position than downslope translocation at the plot position pair. This would suggest that slope gradient does not act alone in determining net downslope soil translocation.

The net downslope soil translocation divided by the distance between plots

provided the rate of soil loss between plots (see Tables 4.6 and 4.7). In comparing the data for each tillage implement on the seven plots positioned on the upper slope landscape positions of the ridges, it was observed that the rate of soil loss between plots was an average 0.19 kg m^{-2} (1.9 t ha^{-1}) for the chisel plow, with losses as high as 2.96 kg m^{-2} and accumulations as high as 1.11 kg m^{-2}; 0.05 kg m^{-2} (0.5 t ha^{-1}) for the moldboard plow, with losses as high as 4.34 kg m^{-2} and accumulations as high as 1.55 kg m^{-2}; 0.43 kg m^{-2} (4.3 t ha^{-1}) for the tandem disc with losses as high as 1.14 kg m^{-2} and accumulations as high as 0.76 kg m^{-2}; 0.54 kg m^{-2} (5.4 t ha^{-1}) and for the cultivator, with losses as high as 2.97 kg m^{-2} and accumulations as high as 0.88 kg m^{-2}. The rate of soil loss on the convex upper slope positions was an average 2.37 kg m^{-2} for the chisel plow, 1.13 kg m^{-2} for the moldboard plow, 0.16 kg m^{-2} for

Table 4.5: Net Downslope Translocation

	Chisel Plow		Moldboard Plow		Tandem Disc		Cultivator	
Plot	Slope Gradient (°)*	Net Downslope Translocation (kg m^{-1})**	Slope Gradient (°)*	Net Downslope Translocation (kg m^{-1})**	Slope Gradient (°)*	Net Downslope Translocation (kg m^{-1})**	Slope Gradient (°)*	Net Downslope Translocation (kg m^{-1})**
1	0.2	71.4	0.3	8.2	1.0	-1.2	1.2	4.8
2	0.5	-13.4	0.7	12.3	3.4	7.9	3.7	14.6
3	3.6	9.0	4.1	14.6	3.4	6.1	3.8	-0.2
4	4.2	13.8	4.6	-1.2	1.9	-5.6	2.2	-0.1
5	3.7	30.4	3.2	11.8	0.8	12.0	0.6	1.2
6	0.4	6.5	0.01	-15.5	6.0	22.6	5.2	-5.5
7	3.5	4.3	4.8	1.8	7.0	24.2	7.9	
8	6.9	3.2	6.5	17.8	5.6	26.9	7.6	8.1
9	2.7	3.4	2.7	-11.1	2.6	8.9	2.0	-8.8
10	2.4	-8.6	2.2	5.4	1.6	3.7	1.2	-8.7
11					3.2	-3.4	2.9	-0.5
12					0.7	-1.5	0.1	6.8

* 1° = 1.75%

** negative values indicate net upslope translocation.

the tandem disc, and -0.42 kg m^{-2} (accumulation) for the cultivator. The rate of soil loss on the steeper of the two slope faces of the ridges was an average -0.03 kg m^{-2} for the chisel plow, -0.42 kg m^{-2} for the moldboard plow, 0.47 kg m^{-2} for the tandem disc, and 0.96 kg m^{-2} for the cultivator. The rate of soil loss on the opposing slope face was an average -1.01 kg m^{-2} for the chisel plow, 0.13 kg m^{-2} for the moldboard plow, 0.63 kg m^{-2} for the tandem disc, and 0.98 kg m^{-2} for the cultivator. Soil losses by primary tillage implements were more localized to the convex upper slope positions, whereas, soil losses by secondary tillage implements were more evenly distributed over the upper slope positions. This may be due to the fact that the ridge at the primary tillage field site was much broader. Soil accumulation on upper slope positions, particularly convex upper slope landscape positions, is evidence of the variability in operating conditions between treatments of tillage implements, resulting in greater upslope translocation at a plot position than downslope translocation at the plot position pair. This suggests that slope gradient and curvature do not act alone in determining the location of soil loss or accumulation.

Table 4.6: Soil Loss by Primary Tillage

	Chisel Plow			Moldboard Plow		
Between Plots	Distance Between Plots (m)	NDT* Between Plots (kg m^{-1})	Soil Loss Between Plots (kg m^{-2})	Distance Between Plots (m)	NDT* Between Plots (kg m^{-1})	Soil Loss Between Plots (kg m^{-2})
2 to 1	39.7	84.7	2.13	38.9	-4.2	-0.11
3 to 2	30.2	-22.4	-0.74	30.2	-2.3	-0.07
4 to 3	4.3	-4.8	-1.11	3.7	15.8	4.34
5 to 4	16.9	-16.7	-0.99	17.7	-13.1	-0.74
6 to 5	8.1	24.0	2.96	7.2	-3.7	-0.51
6 to 7	6.6	10.8	1.64	4.8	17.2	3.58
7 to 8	10.7	-1.1	-0.10	10.4	16.0	1.55
8 to 9	18.9	0.2	0.01	20.2	-28.8	-1.43
9 to 10	17.2	-12.1	-0.70	16.3	16.5	1.01

* Net downslope translocation - negative values indicate soil accumulation between plots.

Based on the information in Tables 4.5 through 4.7 the total soil loss from the upper slope plot positions was 12.4 kg per meter slope width for the chisel plow, 3.4 kg m^{-1} for the moldboard plow, 21.0 kg m^{-1} for the tandem disc and 22.7 kg m^{-1} for the cultivator. The fact that there is soil loss from upper slope positions confirms the observations that tillage translocates less soil up slope faces to crest and more soil down slope faces from the crests for all four tillage implements. Because the results are so variable, the total soil loss, and hence the rate of soil loss, is dependent on the extent of upper slope positions and the plots included therein, i.e. if paired plot 9 of the moldboard plow treatments was excluded the rate of soil loss from upper slope landscape positions would increase from 0.05 kg m^{-2} to 0.74 kg m^{-2}. Interpretations based on the results of this study are very sensitive to the variability of the results.

Table 4.7: Soil Loss by Secondary Tillage Implements

	Tandem Disc			Cultivator		
Between Plots	Distance Between Plots (m)	NDT* Between Plots (kg m^{-1})	Soil Loss Between Plots (kg m^{-2})	Distance Between Plots (m)	NDT* Between Plots (kg m^{-1})	Soil Loss Between Plots (kg m^{-2})
2 to 1	10.8	-9.1	-0.84	10.1	-9.8	-0.97
3 to 2	6.2	1.8	0.30	5.0	14.8	2.97
4 to 3	13.9	11.7	0.84	10.0	-0.1	-0.01
5 to 4	9.8	-7.4	-0.76	5.6	1.1	0.20
5 to 6	9.3	10.6	1.14	7.6	-6.7	-0.88
6 to 7	5.9	1.6	0.27	10.8+3.3	13.6	1.03
7 to 8	3.3	2.7	0.82			
8 to 9	11.8	-18.0	-1.53	13.7	-16.9	-1.23
9 to 10	2.0	-5.2	-2.60	2.0	0.1	0.05
11 to 10	10.7	7.1	0.66	8.8	-8.2	-0.93
12 to 11	10.8	-1.9	-0.17	9.8	-7.3	-0.75

* Net downslope translocation - negative values indicate soil accumulation between plots.

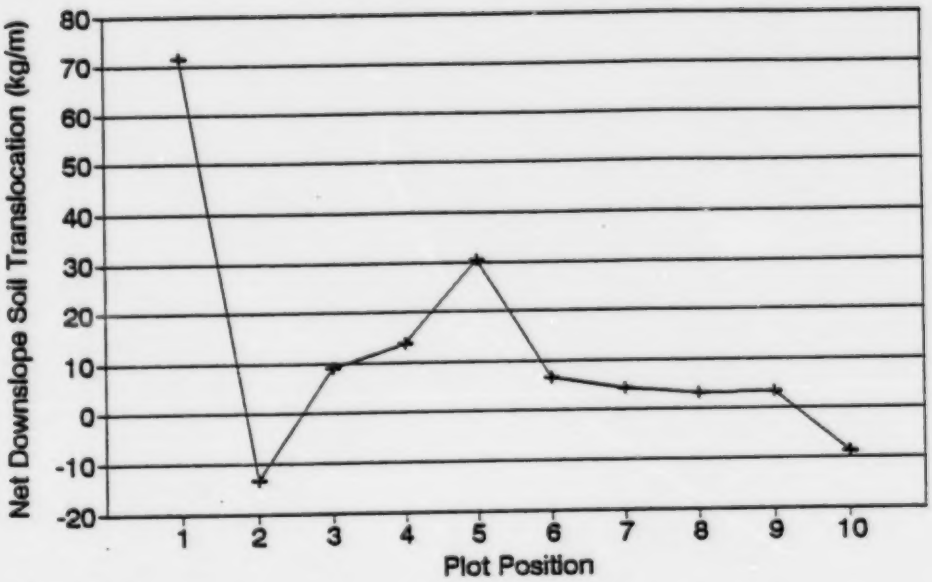

Figure 4.12: Net downslope soil translocation by chisel plow.

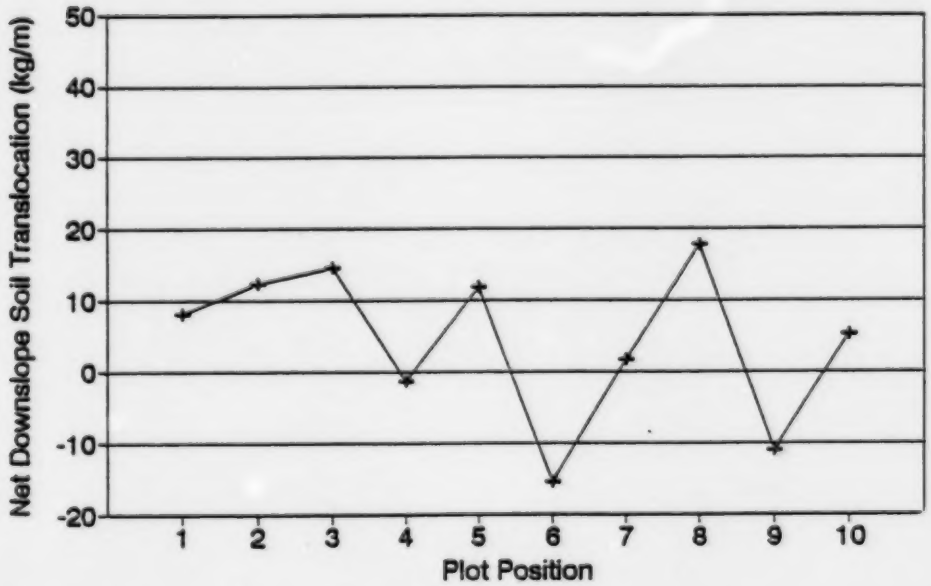

Figure 4.13: Net downslope soil translocation for the moldboard plow.

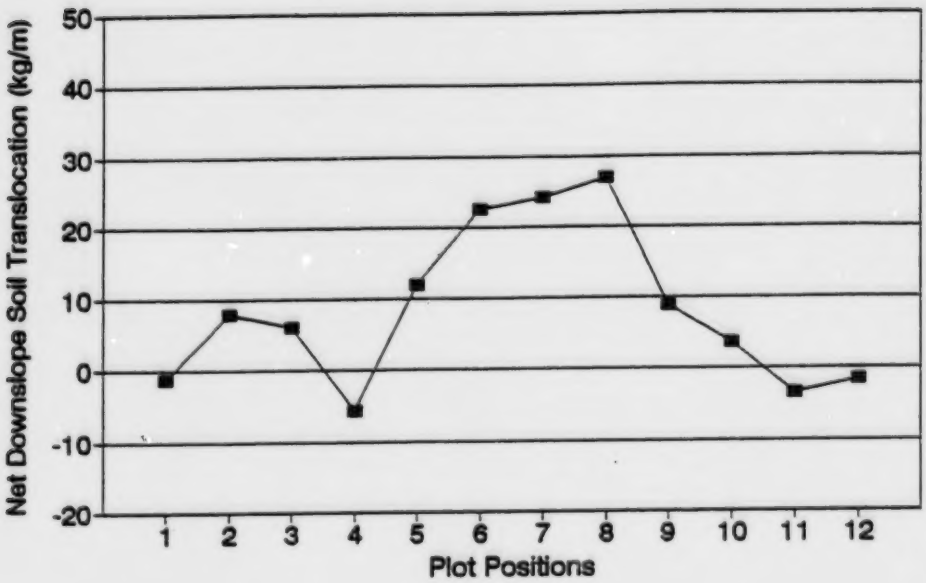

Figure 4.14: Net downslope soil translocation for the tandem disc.

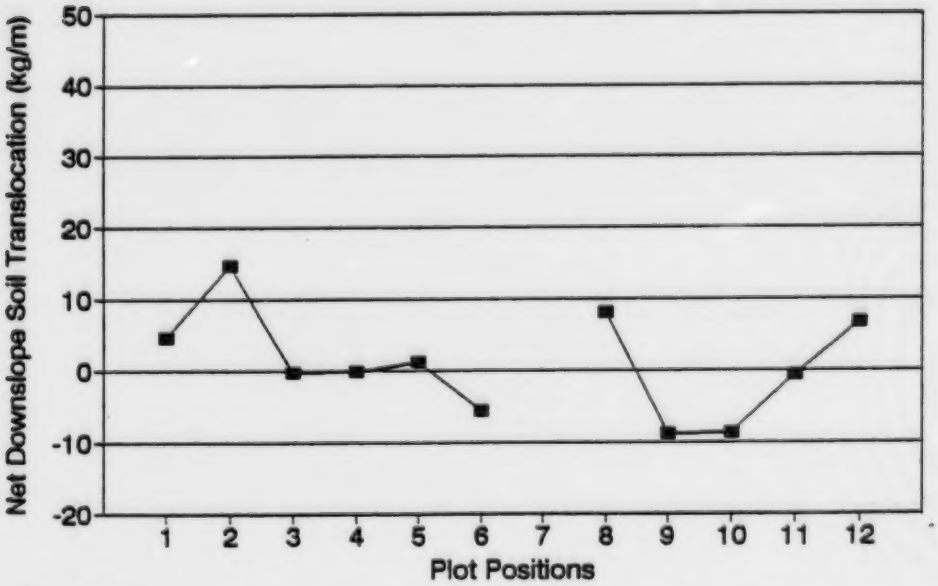

Figure 4.15: Net downslope soil translocation for the cultivator.

Two approaches were taken in dealing with the variability of the results. The first involved combining the results from the moldboard plow and the secondary tillage implements to construct a conventional tillage sequence. By increasing the number of tillage passes any underlying trends were expected to be more evident. The conventional tillage sequence consisted of moldboard plow, tandem disc (double pass) and cultivator (single pass). This tillage sequence, and the tillage equipment used, was identical to that used by Kachanoski et al. (1992b). This procedure did not appear to reduce the variability or reveal any underlying trends. The total soil lost from the plots on upper slope landscape positions was estimated to be 68.1 kg per meter slope width. The mean rate of soil loss on the upper slope landscape positions was estimated to be as little as 1.07 kg m^{-2} (10.7 t ha^{-1}),if the distance between plots of the moldboard plow treatments was used, or as high as 1.61 kg m^{-2} (16.1 t ha^{-1}), if the distance between plots of the cultivator treatments was used. The distance over which the mean rate of soil loss was calculated included plots on linear backslope positions as well as convex upper slope positions. The rate of rate soil loss between plots for the conventional tillage sequence using the distance between plots of the cultivator treatments was as high as 6.84 kg m^{-2} (68.4 t ha^{-1}) and as little as -3.11 kg m^{-2} (accumulation). These values of soil loss are the rates of soil loss from two complete conventional tillage sequences.

The above rates of soil loss are equal to or less than one half of those reported by Kachanoski et al. (1992b). Kachanoski et al. (1992b) reported soil loss rates of 12.42 kg m^{-2} (124.2 t ha^{-1}) to 13.72 kg m^{-2} (137.2 t ha^{-1}) for two complete tillage sequences. However, these soil loss rates are estimates based on measurements of soil translocation measured on shoulder slope positions alone and an assumed source length (convex upslope distance) of 3 m. The measurements of soil translocation and net downslope soil translocation in both studies are similar. The difference between soil loss rates reported in the two studies may reflect differences in topography or possibly the underestimation of the source length in the preceding study.

The second approach taken in dealing with the variability in the results utilized the measurements of slope gradient, tillage depth and tillage ground speed to examine

the relationships between these variables and soil translocation.

4.5 Effect of Slope Gradient on Soil Translocation and Net Downslope Translocation

The interpretation of the results in the following sections are based on the simple relationships between the variables slope gradient, tillage depth, tillage ground speed and soil translocation, both soil volume translocation (VT) and soil mass translocation (MT). These relationships are assessed on the basis of their correlation coefficient, r. Snedecor and Cochran (1980) state that for an r^2 value of 0.8, 80 % of the variation in the dependent variable can be attributed to its linear regression of the independent variable, and 50% for an r^2 value of 0.5. When r^2 is less than 0.25 only a minor portion of the variation of the dependent variable is associated with the independent. For the examination of the relationships below, plots on linear slopes (lsp) were examined separately to eliminate any confounding by curvilinear surfaces. The tillage treatments were analyzed individually and paired by tillage implement. A more complex analysis of the relationships using multiple regression techniques was not conducted for this study.

Analysis of the data grouped by tillage implement indicated a moderate positive relationship between slope gradient and soil translocation for the tandem disc treatments [VT: $r^2=0.62$ ($r^2=0.63$ for lsp); MT: $r^2=0.64$ ($r^2=0.66$ for lsp)].

When treatments were analyzed individually the data indicated a strong positive relationship between slope gradient and soil translocation for the tandem disc treatment 1 [VT: $r^2= 0.92$ ($r^2=0.98$ for lsp); MT: $r^2=0.93$ ($r^2=0.98$ for lsp)]. Data indicated a moderate positive relationship for the tandem disc treatment 2 [VT: $r^2=0.37$ ($r^2=0.43$ for lsp); MT; $r^2=0.45$ ($r^2=0.52$ for lsp)], and chisel plow treatment 2 [VT: $r^2=0.62$ ($r^2=0.50$ for lsp); MT: $r^2=0.64$ ($r^2=0.56$ for lsp)]. Data indicated a weak positive relationship for the cultivator treatment 4 [VT: $r^2=0.01$ (0.37 for lsp); MT: $r^2=0.01$ ($r^2=0.48$ for lsp)].

Analysis of the data grouped by tillage implement indicated a strong positive relationship between slope gradient and net downslope soil translocation for the tandem disc [$r^2=0.63$ ($r^2=0.78$ for lsp)]. Data indicated a weak positive relationship

for the chisel plow [$r^2=0.14$ ($r^2=0.39$ for lsp)].

There is some indication that both soil translocation and net downslope translocation increase as slope gradient increases. This is a logical response to increased slope gradient, because as slope gradient increases the effect of gravity on the soil mass elevated by the tillage tools, and the effect of gravity on the combined mass of the tractor, tillage implement and the soil being carried by the tillage tools increases.

4.6 Effect of Tillage Ground Speed on Soil Translocation

Analysis of the data grouped by tillage implement indicated a moderate positive relationship between tillage ground speed and soil translocation for the tandem disc treatments [VT: $r^2=0.0.30$ ($r^2=0.61$ for lsp); MT: $r^2=0.31$ ($r^2=0.61$ for lsp)].

When treatments were analyzed individually the data indicated a strong positive relationship between tillage ground speed and soil translocation for the tandem disc treatment 1 [VT; $r^2= 0.67$ ($r^2=0.97$ for lsp); MT; $r^2=0.68$ ($r^2=0.97$ for lsp)].

There is some indication that soil translocation increases as tillage ground speed increases. This is a logical response to increased ground speed, because as ground speed increases soil displacement can only increase. The degree of this response may be affected by tillage tool shape. Tillage tool shape determines how the soil is displaced; whether displacement occurs as a simple inversion (moldboard) or shattering and throwing (disc and sweep).

4.6.1 Ground Speed Experiments

There was no statistically significant difference between the soil volume or mass translocated by the moldboard plow on the level surface (see Table 4.8). The variability in soil properties, slope gradient, tillage depth, and tillage operator on soil translocation was minimized in this controlled experiment. The variability observed in the results may be due to experimental error in the sampling procedure or tracer analysis.

This analysis does not exclude the possibility that tillage ground speed interacts

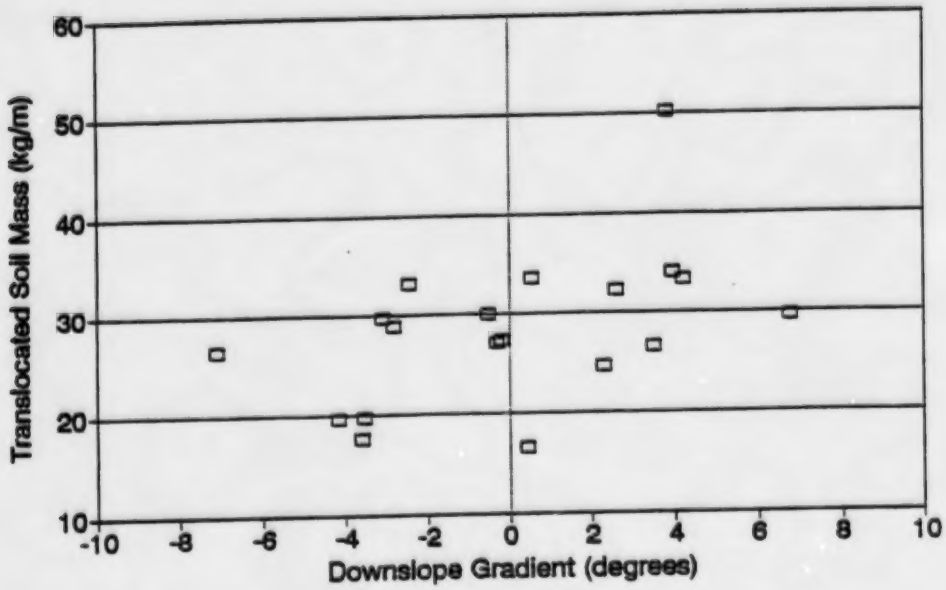

Figure 4.16: Effect of slope gradient on soil translocation - chisel plow treatments.

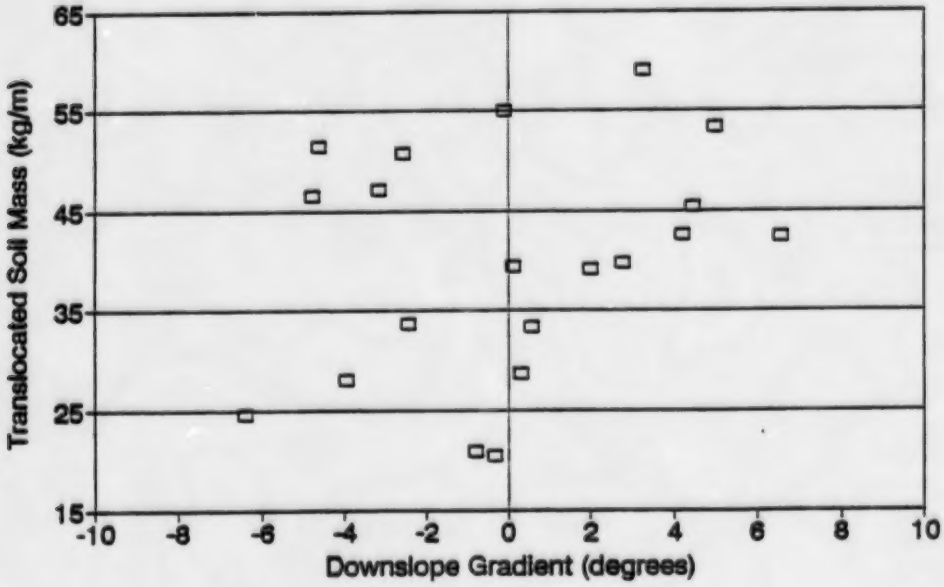

Figure 4.17: Effect of slope gradient on soil translocation - moldboard plow treatments.

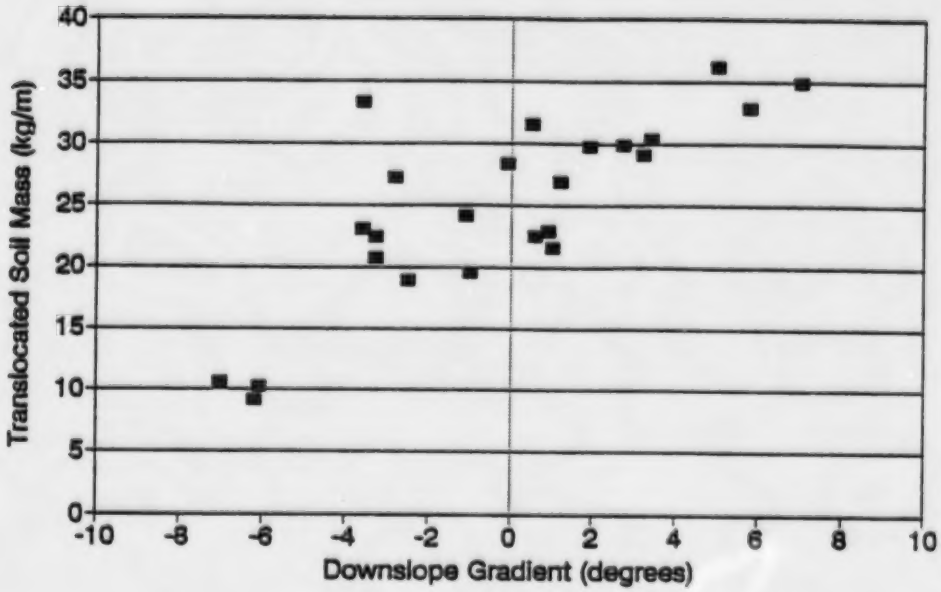

Figure 4.18: Effect of slope gradient on soil translocation - tandem disc treatments.

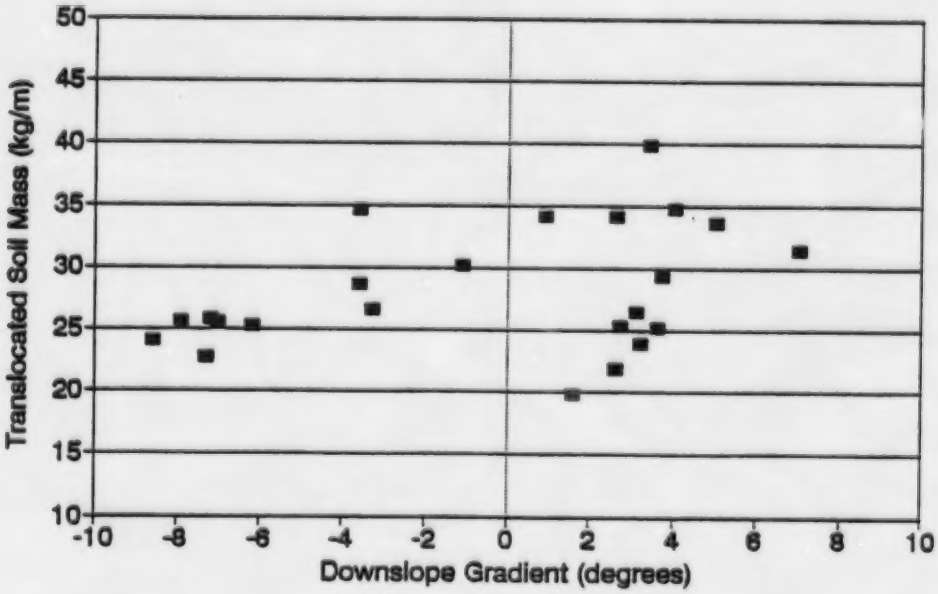

Figure 4.19: Effect of slope gradient on soil translocation - cultivator treatments.

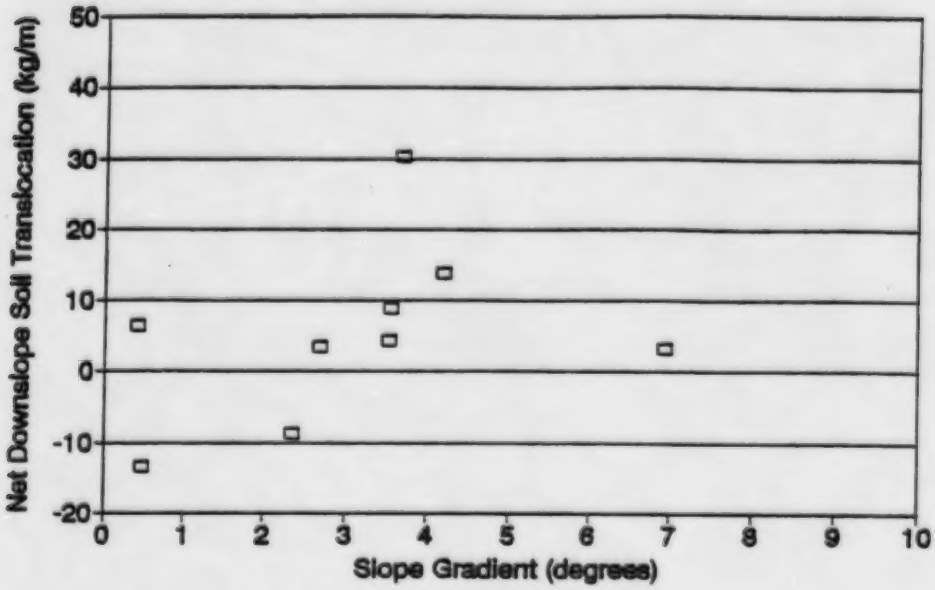

Figure 4.20: Effect of slope gradient on net downslope soil translocation - chisel plow treatments.

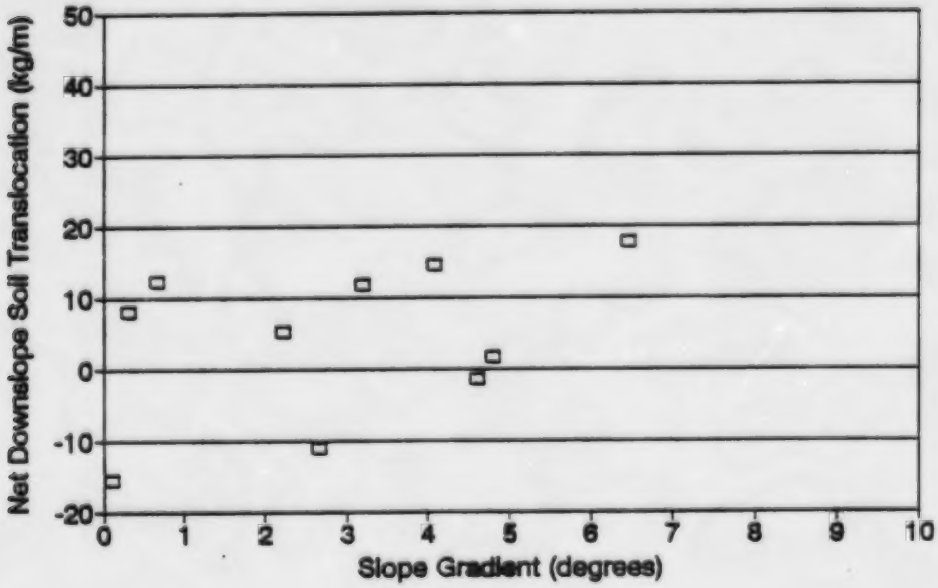

Figure 4.21: Effect of slope gradient on net downslope soil translocation - moldboard plow treatments.

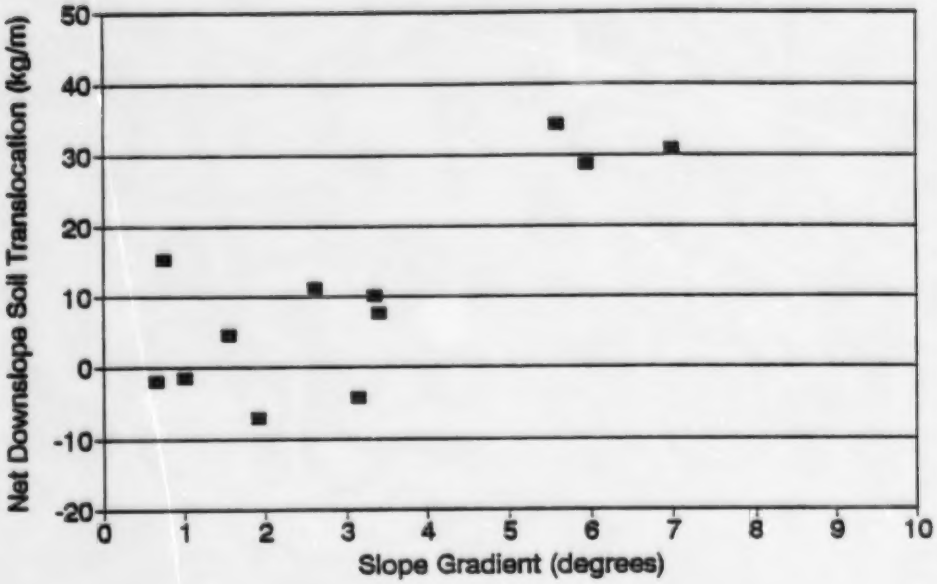

Figure 4.22: Effect of slope gradient on net downslope soil translocation - tandem disc treatments.

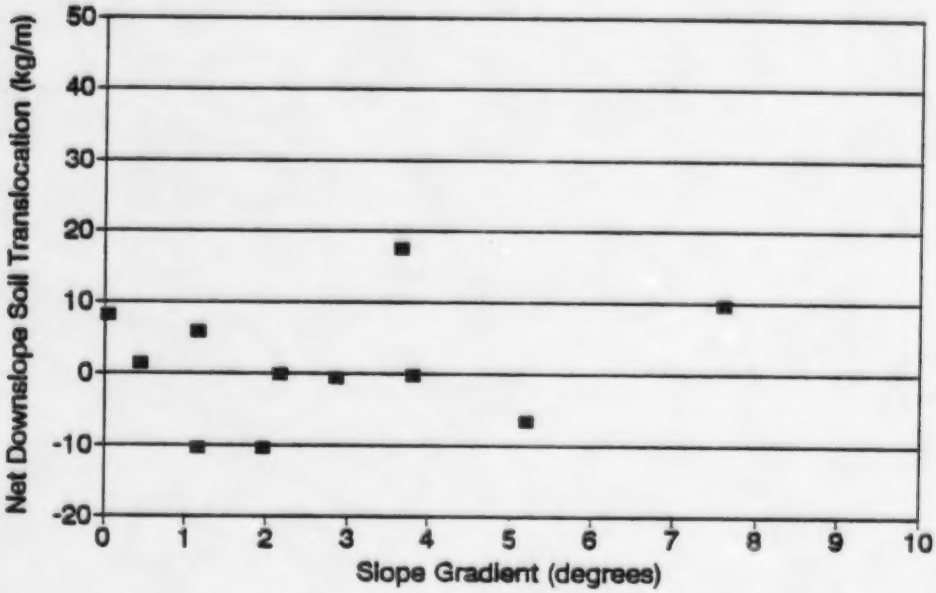

Figure 4.23: Effect of slope gradient on net downslope soil translocation - cultivator treatments.

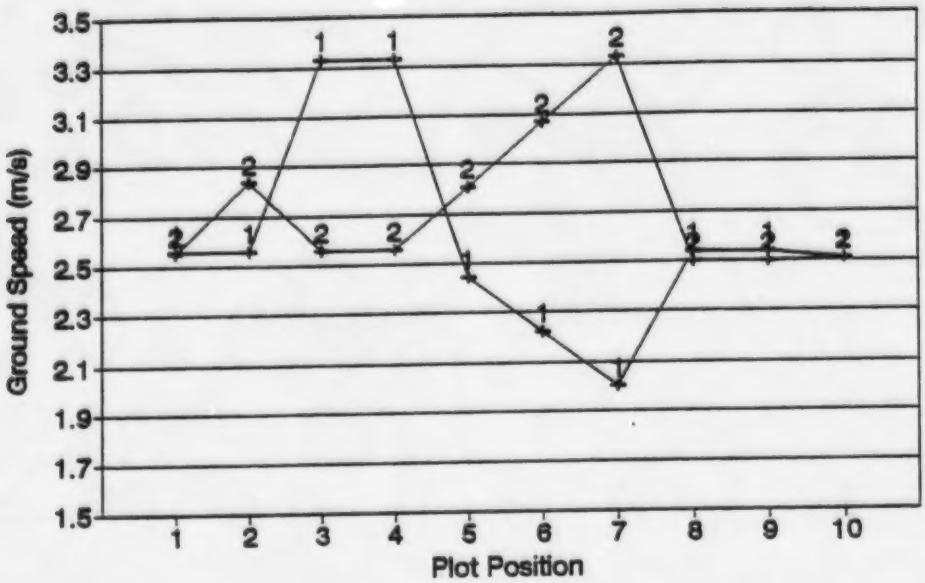

Figure 4.24: Tillage ground speed - chisel plow treatments.

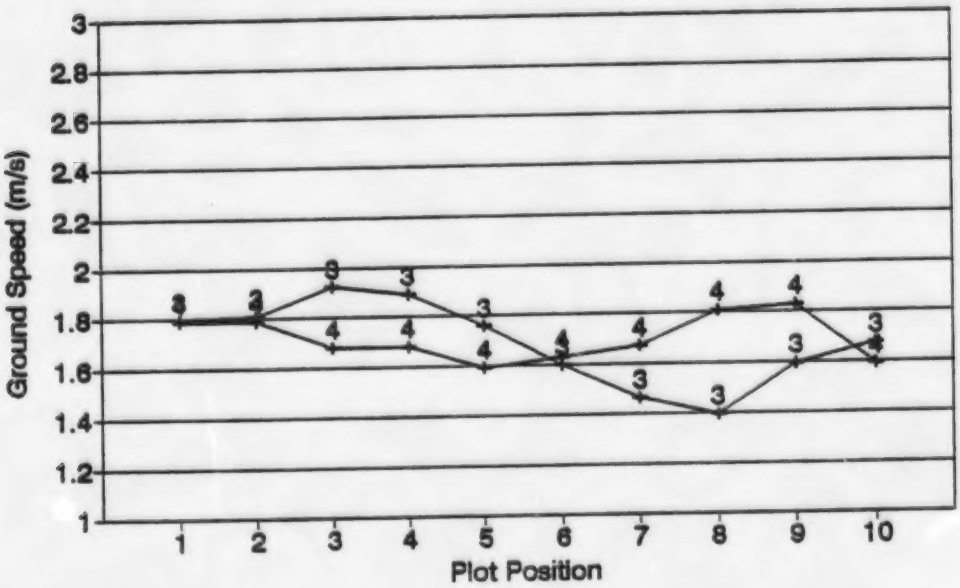

Figure 4.25: Tillage ground speed - moldboard plow treatments.

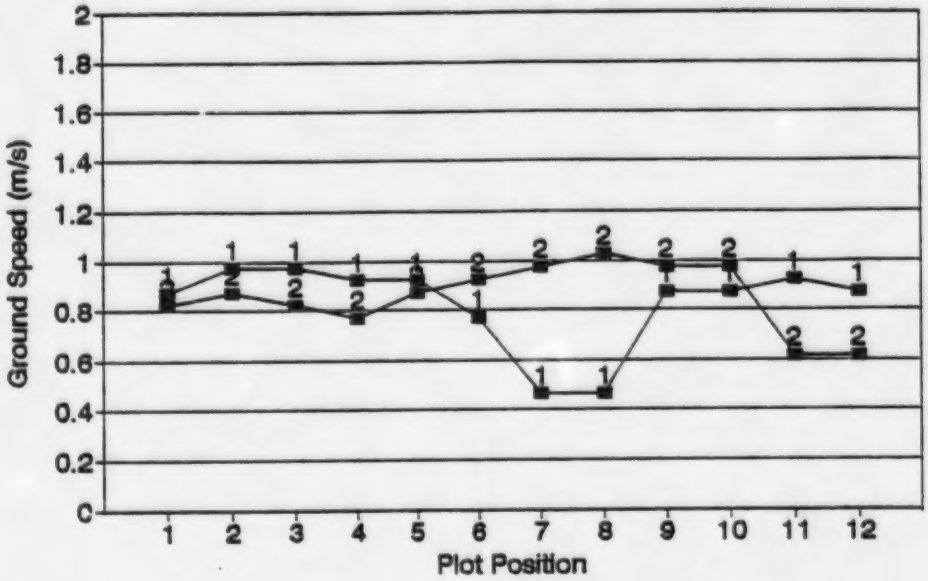

Figure 4.26: Tillage ground speed - tandem disc treatments.

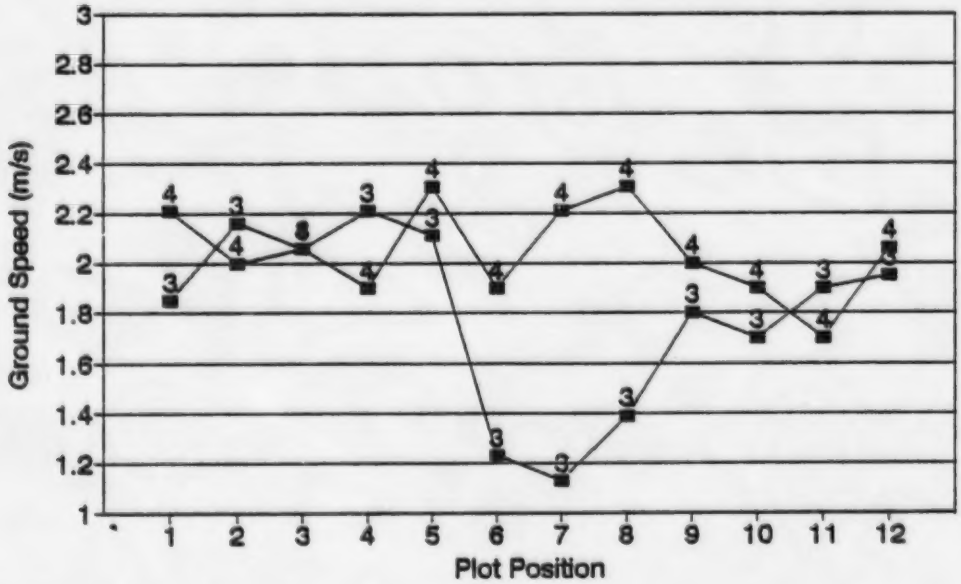

Figure 4.27: Tillage ground speed - cultivator treatments.

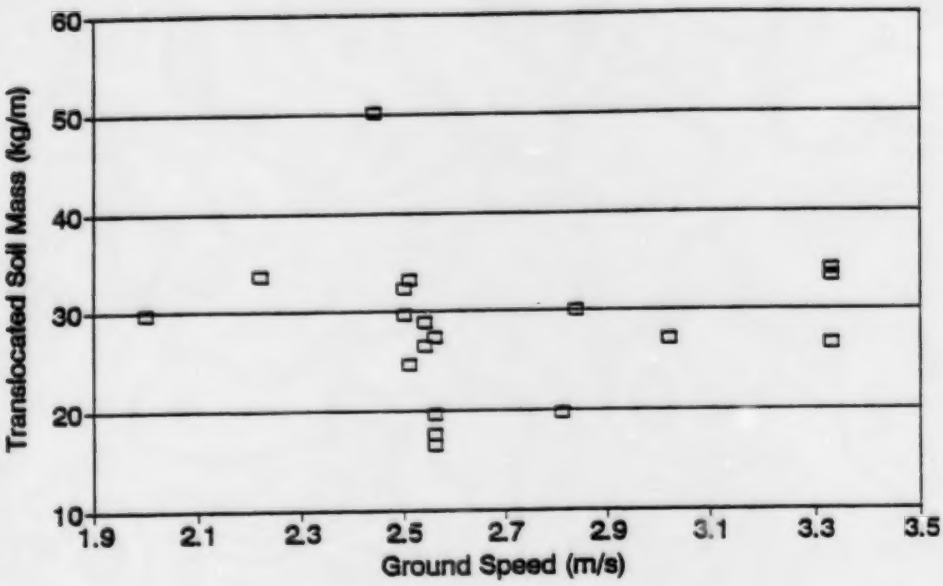

Figure 4.28: Effect of ground speed on soil translocation - chisel plow treatments.

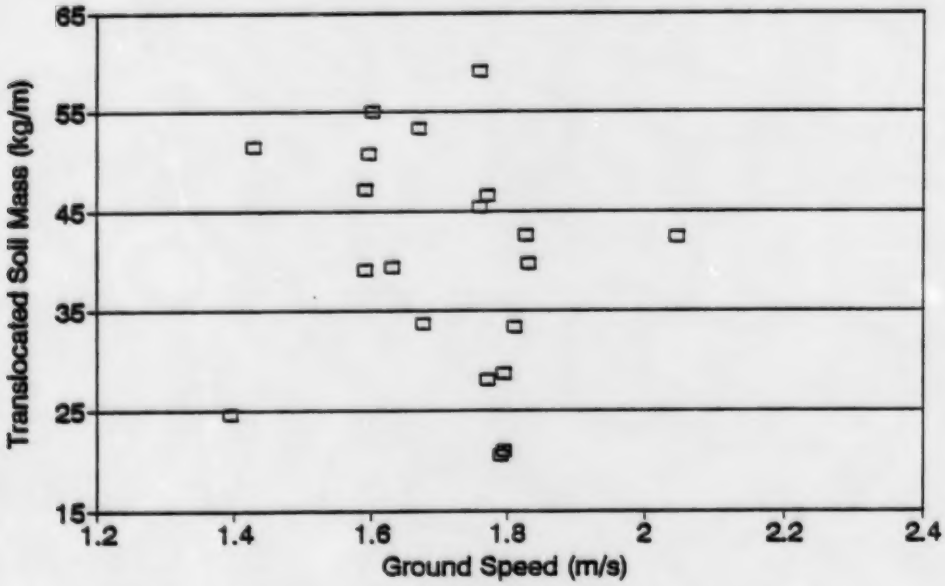

Figure 4.29: Effect of ground speed on soil translocation - moldboard plow treatments.

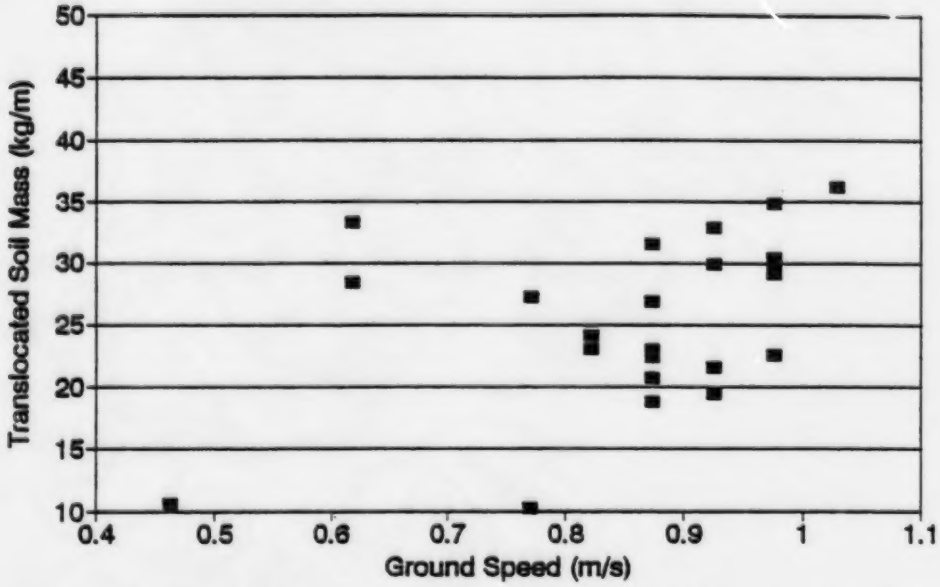

Figure 4.30: Effect of ground speed on soil translocation - tandem disc treatments.

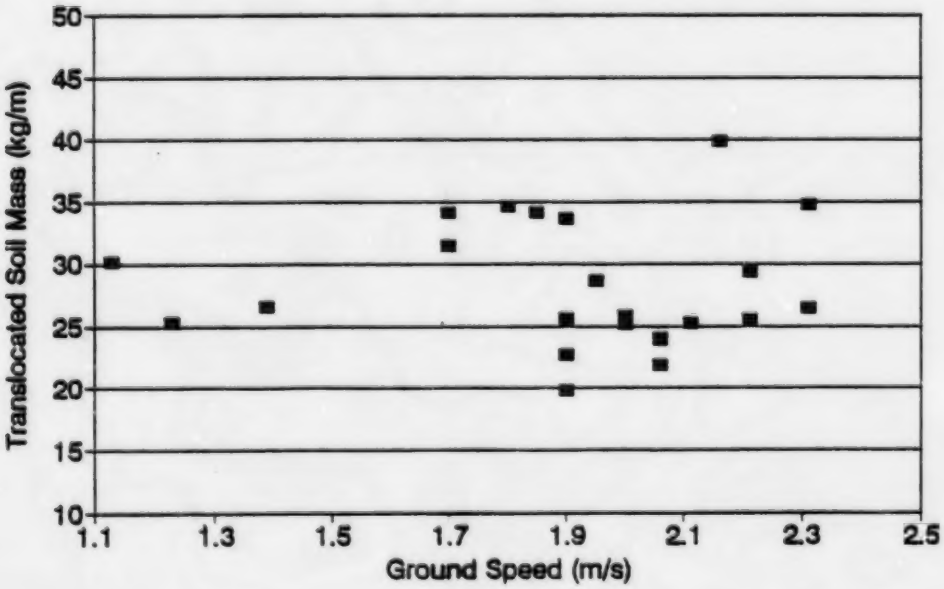

Figure 4.31: Effect of ground speed on soil translocation - cultivator treatments.

with other factors to affect soil translocation in complex topography. It is possible that ground speed will not affect soil translocation for specific tillage tools. A tillage tool such as the moldboard may simply displace the soil through inversion-displacement, and increased ground speeds may only result in the same displacement occurring in a shorter time period.

Table 4.8: Soil Translocation Measurements for Ground Speed Experiments

Replicate	Treatment 1 (0.97 m s^{-1})		Treatment 2 (1.54 m s^{-1})		Treatment 3 (2.06 m s^{-1})	
	Volume (m^3 m^{-1})	Mass (kg m^{-1})	Volume (m^3 m^{-1})	Mass (kg m^{-1})	Volume (m^3 m^{-1})	Mass (kg m^{-1})
1	0.035	56.0	0.034	55.4	0.035	56.7
2	0.033	65.8	0.041	66.9	0.029	46.4
3	0.019	30.9	0.025	41.2	0.028	53.7
Treatment Average	0.029	50.9	0.033	54.5	0.031	52.3
Standard Deviation	0.009	18.0	0.008	12.9	0.003	5.9

4.7 Effect of Tillage Depth on Soil Translocation

Where tillage depth could not be measured till layer depth was used as an indicator of tillage depth. However, till layer depth on the secondary tillage treatments reflected the tillage depth of the antecedent tillage operations (moldboard plow) rather than the tillage operation under examination. For this reason, till layer depth and secondary tillage soil translocation measurements may be totally unrelated.

Analysis of the data grouped by tillage implement indicated a weak positive relationship between till depth and soil translocation for the moldboard plow treatments [VT: $r^2=0.28$; MT: $r^2=0.29$], and a weak negative relationship between till depth and the cultivator treatments [VT: $r^2=0.26$ ($r^2=0.23$ for lsp); MT: $r^2=0.28$ ($r^2=0.23$ for lsp)].

When treatments were analyzed individually the data indicated a strong positive relationship between tillage depth and soil translocation for the chisel plow treatment 2 [VT: $r^2=0.69$ (0.72 for lsp); MT: $r^2=0.60$ (0.76 for lsp], and the moldboard plow treatment 4 [VT: $r^2=0.53$ ($r^2=0.70$ for lsp); MT: $r^2=0.44$ ($r^2=0.59$ for lsp)]. Data indicated a moderate negative relationship for cultivator treatment 3 [VT: $r^2=0.28$ ($r^2=0.55$ for lsp); MT: $r^2=0.25$ ($r^2=0.56$ for lsp)]. Data indicated a weak positive relationship for moldboard plow treatment 3 [MT: $r^2=0.25$], tandem disc treatment 1 [VT: $r^2=0.12$ ($r^2=0.46$ for lsp); MT: $r^2=0.12$ ($r^2=0.47$ for lsp)] and treatment 2 [VT: $r^2=0.26$ ($r^2=0.43$ for lsp); MT: $r^2=0.18$ ($r^2=0.37$ lsp)].

There is some indication that soil translocation increases as tillage depth increases. This is a logical response to increased tillage depth, because as tillage depth increases the volume and mass of soil displaced increases. However, if tillage ground speed is negatively impacted by increased tillage depth it is possible that the increase in soil translocation may not be observed.

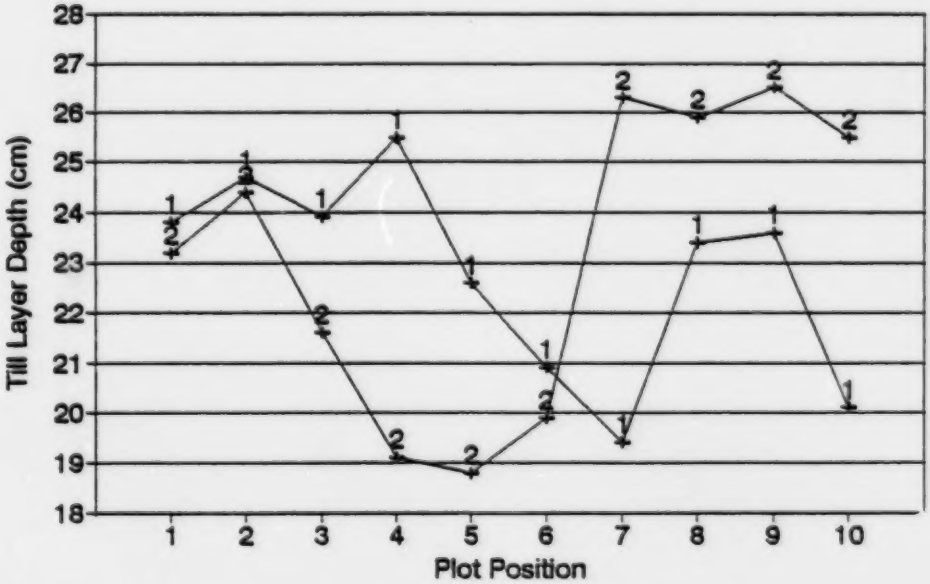

Figure 4.32: Till layer depth after tillage - chisel plow treatments.

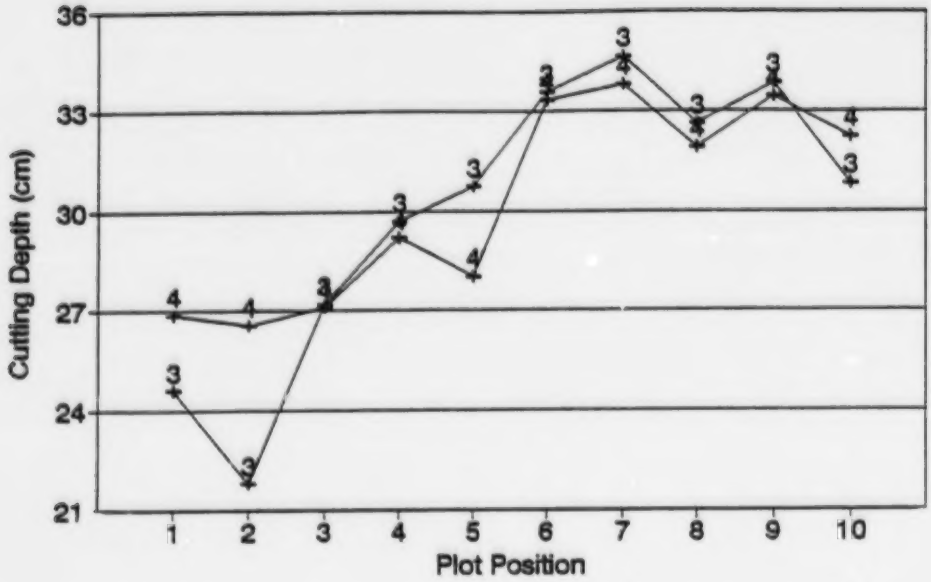

Figure 4.33: Till layer depth after tillage - moldboard plow treatments.

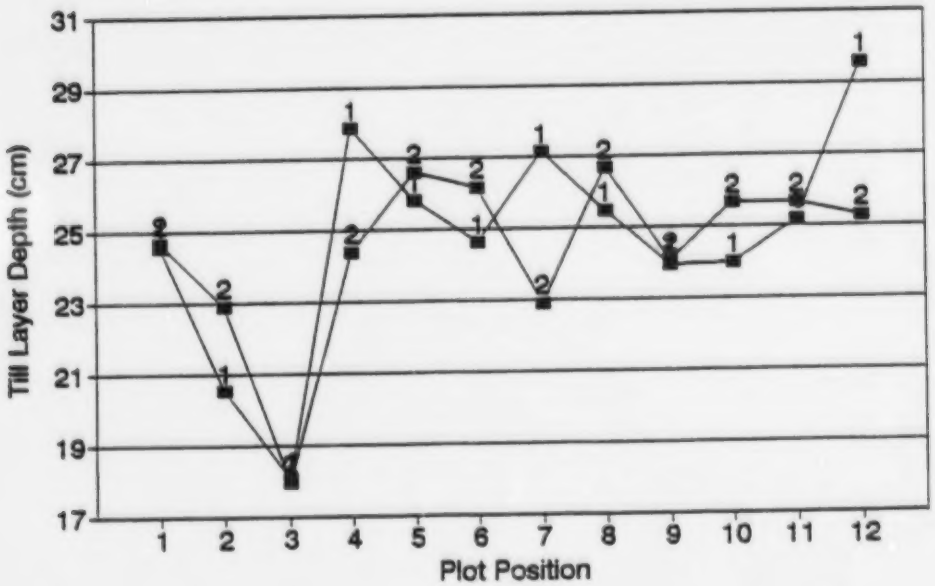

Figure 4.34: Till layer depth after tillage - tandem disc treatments.

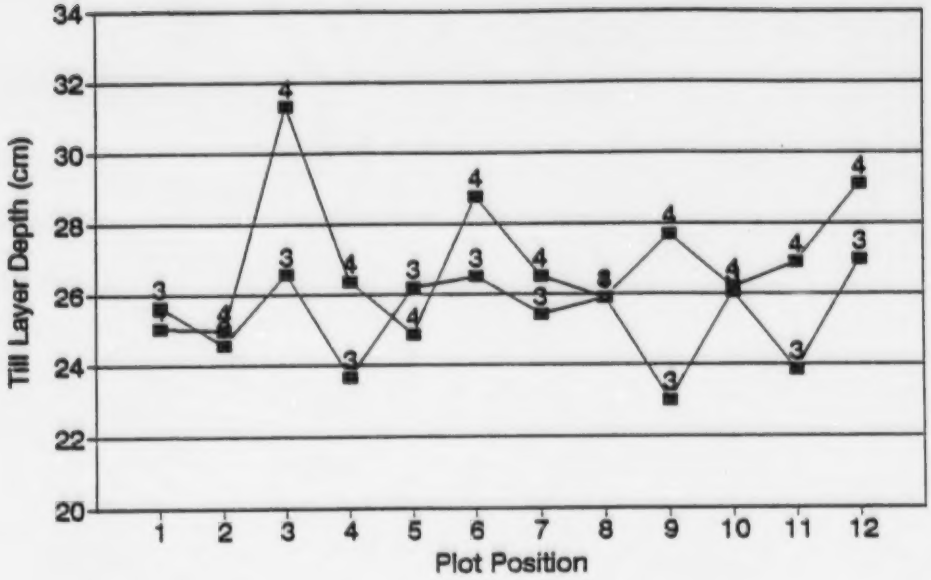

Figure 4.35: Till layer depth after tillage - cultivator treatments.

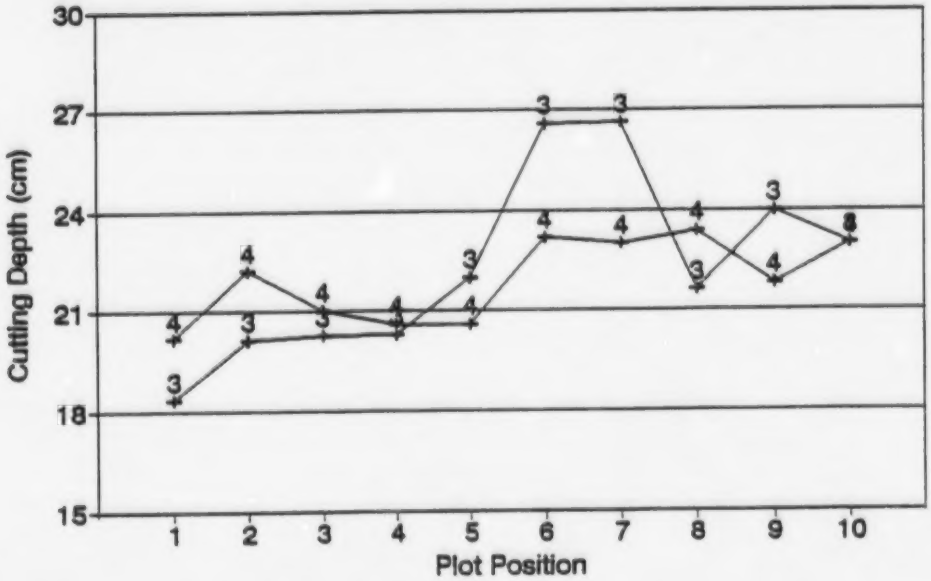

Figure 4.36: Tillage depth - moldboard plow treatments.

4.8 Effect of Slope Gradient on Tillage Ground Speed

Analysis of the data grouped by tillage implement indicated a moderate positive relationship between slope gradient and tillage ground speed for the moldboard plow treatments [$r^2=0.40$ ($r^2=0.44$ for lsp)], for the tandem disc treatments [$r^2=0.56$], and for the cultivator treatments [$r^2=0.54$]. Data indicated a weak positive relationship for the chisel plow [$r^2=0.13$ ($r^2=0.28$ for lsp)].

When treatments were analyzed individually the data indicated a strong positive relationship between tillage depth and soil translocation for the cultivator treatment 3 [$r^2=0.82$]. Data indicated a moderate positive relationship between tillage depth and soil translocation for the chisel plow treatment 1 [$r^2=0.39$ ($r^2=0.62$)], for the moldboard plow treatment 3 [$r^2=0.76$ ($r^2=0.76$ for lsp)], for the tandem disc treatment 1 [$r^2=0.69$], and for the tandem disc treatment 2 [$r^2=0.42$].

There is some indication that ground speed increases as slope gradient increases from negative to positive; negative slope gradients signify upslope tillage, positive slope gradients signify downslope tillage. This is a logical response to increased slope gradient, because as slope gradient increases, the power requirement to maintain constant tillage ground speed decreases; gravity works for the tractor on positive slope gradients and against the tractor on negative slope gradients. The effect of gravity increases as the combined mass of the tractor, tillage implement and the soil being carried by the tillage tools increases. This suggests that the tractor-implement match could affect the degree of ground speed response to slope gradient.

4.9 Effect of Slope Gradient on Tillage Depth

Where tillage depth could not be measured till layer depth was used as an indicator of tillage depth. However, till layer depth on the secondary tillage treatments reflected the tillage depth of the antecedent tillage operations (moldboard plow) rather than the tillage operation under examination.

Analysis of the data for the moldboard plow grouped by treatment indicated no relationship between slope gradient and tillage depth. When treatments were analyzed individually the data indicated a moderate positive relationship between slope

gradient and tillage depth for the moldboard plow [$r^2=0.56$ (0.60 for lsp)].

Analysis of the data grouped by tillage implement indicated a moderate positive relationship between slope gradient and till layer depth for the chisel plow treatments [$r^2=0.42$ ($r^2=0.56$ for lsp)]. When treatments were analyzed individually the data indicated a strong positive relationship between slope gradient and tillage depth for the chisel plow treatment 2 [$r^2=0.71$ (0.77 for lsp)]. Data indicated a moderate positive relationship for moldboard plow treatment 4 [$r^2=0.44$ ($r^2=0.45$ for lsp)]. Data indicated a weak positive relationship for chisel plow treatment 1 [VT: $r^2=0.21$ ($r^2=0.25$ for lsp)]. Data indicated a moderate negative relationship for tandem disc treatment 1 [$r^2=0.52$].

It is uncertain why there would be any relationship between slope gradient and tillage depth. It was anticipated that tillage depth would increase as the tillage implements were drawn over the convex slope positions and decrease over the concave slope positions, due to the planing effect of tillage. The relationship between tillage depth and slope curvature has not been thoroughly examined. Any indication of a relationship between slope gradient and tillage depth may be indirect evidence of another relationship.

4.10 Effect of Tillage Depth on Tillage Ground Speed

Analysis of the data grouped by tillage implement indicated no relationship between tillage ground speed and either tillage depth or till layer depth for either of the primary tillage implements.

When treatments were analyzed individually the data indicated a moderate negative relationship between ground speed and tillage depth for the moldboard plow treatment 3 [$r^2=0.44$ ($r^2=0.33$ for lsp)]. Data indicated a moderate negative relationship between ground speed and till layer depth for the moldboard plow treatment 3 [$r^2=0.60$ ($r^2=0.57$ for lsp)]. For reasons stated in Section 4.7 the relationship between tillage depth and tillage ground speed for the secondary tillage implements was not examined.

There is some indication that ground speed decreases as tillage depth increases.

This is a logical response to increased tillage depth, because as tillage depth increases the power requirement to maintain constant tillage ground speed increases; more soil mass is being drawn by the tractor. This suggests that the tractor-implement match could affect the degree of ground speed response to tillage depth.

5.0 SUMMARY

Measurements of soil translocation, net downslope translocation and soil loss varied tremendously between tillage implements and between treatments of tillage implements. The consequence of this variability was that soil loss and accumulation were observed throughout the topography, regardless of slope position. Although this variability existed, soil losses were observed on the upper slope landscape positions for all four tillage implements, indicating that less soil is translocated upslope than downslope by each tillage implement. The chisel plow, moldboard plow, tandem disc and cultivator all caused tillage erosion which resulted in soil loss.

Measured soil losses resulting from two passes, one upslope and the second downslope, of the chisel plow, moldboard plow, tandem disc and cultivator, when averaged over the upper slope landscape positions, were 0.19 kg m^{-2}, 0.05 kg m^{-2}, 0.43 kg m^{-2}, and 0.54 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the average soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were 0.09 kg m^{-2} (0.9 t ha^{-1}), 0.03 kg m^{-2} (0.3 t ha^{-1}), 0.22 kg m^{-2} (2.2 t ha^{-1}), and 0.27 kg m^{-2} (2.7 t ha^{-1}), respectively. These observed values of soil loss are relatively small and within tolerable limits.

Maximum measured soil losses between plots within the upper slope landscape positions resulting from two passes, one upslope the other downslope, of the chisel plow, moldboard plow, tandem disc and cultivator were 2.96 kg m^{-2}, 4.34 kg m^{-2}, 1.14 kg m^{-2}, and 2.97 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the maximum soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were 1.48 kg m^{-2} (14.8 t ha^{-1}), 2.17 kg m^{-2} (21.7 t ha^{-1}), 0.57 kg m^{-2} (5.7 t ha^{-1}), and 1.49

kg m^{-2} (14.9 t ha^{-1}), respectively. Clearly, the rate of soil loss within complex topography is a function of scale. These observed values of soil loss are relatively small, but exceed tolerable limits.

The range between minimum and maximum values of soil translocation for each tillage implement provided indicators of potential net downslope soil translocation. The ranges for the chisel plow, moldboard plow, tandem disc and cultivator were 33.6 kg m^{-1}, 38.5 kg m^{-1}, 26.9 kg m^{-1}, 20.0 kg m^{-1}, respectively. The potential soil losses from the upper slope landscape positions, based on these ranges, for the chisel plow, moldboard plow, tandem disc and cultivator were 0.51 kg m^{-2}, 0.60 kg m^{-2}, 0.55 kg m^{-2}, 0.47 kg m^{-2}, respectively. Assuming each tillage operation is conducted upslope and downslope equally as often, the potential soil losses per tillage pass for the chisel plow, moldboard plow, tandem disc and cultivator, were 0.26 kg m^{-2} (2.6 t ha^{-1}), 0.30 kg m^{-2} (3.0 t ha^{-1}), 0.28 kg m^{-2} (2.8 t ha^{-1}), and 0.29 kg m^{-2} (2.9 t ha^{-1}). Maximum absolute values of net downslope soil translocation for each tillage implement provided indicators of potential soil loss. The maximum absolute values for the chisel plow, moldboard plow, tandem disc and cultivator were 30.4 kg m^{-1}, 17.8 kg m^{-1}, 26.9 kg m^{-1}, 14.6 kg m^{-1}, respectively. All four tillage implements are considered erosive, however, the relative erosivity of the four implements could not be assessed conclusively because of the variability in the data.

The results indicate that there are relationships between slope gradient, tillage depth and tillage ground speed, however, these relationships are not always strong nor are they consistent between tillage implements or between tillage treatments of tillage implements. This observation may suggest that there are other factors involved in the translocation of soil by tillage other than slope gradient, tillage depth and tillage ground speed. The shape and arrangement of tillage tools, and the responsiveness of tillage operator, as well as slope gradient, tillage depth and tillage ground speed, may also affect soil translocation.

In theory, the volume of soil is determined by the tillage depth and the shape and arrangement of the tillage tools; the mass of soil translocated is determined by the soil bulk density; and the extent of the translocation is determined by the shape

of the tillage tools, the ground speed of the tillage implement and the slope gradient. The tillage operator continuously adjusts both tillage depth and tillage speed, through the adjustment of gear ratio, to compensate for the effect of gravity on the mass of the tillage equipment as it moves through the landscape. Evidence of this is the negative net downslope soil translocation measurements on upper slope landscape positions which suggest that the operator, through the manipulation of tillage depth and tillage ground speed, can cause net upslope translocation rather than net downslope translocation on upper slope landscape positions. The degree to which the operator has to adjust tillage depth and ground speed will depend on the tractor-implement match. A more powerful tractor, for a given tillage implement operated on a given landscape, will require less adjustment of ground speed and tillage depth by the operator. The responsiveness of the operator will undoubtedly affect the relationships between the many variables.

6.0 IMPLICATIONS

The implications of this study reaffirm the implications of the preceding study "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b). In brief, those implications were: 1) soil loss caused by tillage erosion is not restricted to shoulder slope landscape positions; 2) predictive soil loss and crop productivity models that do not include the process of tillage erosion do not represent reality on cultivated agricultural land in complex topography; and 3) preventative and corrective soil loss measures that do not include the reduction of tillage erosion will not be effective in controlling soil loss on upper slope landscape positions of cultivated agricultural land.

Implications arising directly from this study include:

1) factors affecting tillage erosion include not only slope gradient and curvature, tillage depth, tillage ground speed and soil conditions, but also tillage tool shape and arrangement, tractor-implement match and the response of the tillage operator to changing slope gradient; and

2) studies which examine single tillage operations of specific tillage implements with

limited replications have the potential to generate highly variable data due to the numerous factors involved, resulting in observations of soil loss and soil accumulation throughout the topography.

7.0 RECOMMENDATIONS

Recommendations to reduce tillage erosion induced soil losses on upper slope landscape positions in the upland regions of southwestern Ontario were outlined in the preceding study "Management of Farm Field Variability: II. Soil Erosion Processes on Shoulder Slope Landscape Positions" by Kachanoski et al. (1992b). In brief, those recommendations were: 1) reduce tillage frequency; 2) reduce tillage intensity; 3) reduce the size of tillage implements; and 4) vary tillage patterns within fields. All four tillage implements were found to be erosive, but it could not be concluded which of the above recommendations would provide the greatest reductions in soil loss resulting from tillage erosion.

The following are recommendations for further research:

1) develop a practical and accurate method of measuring tillage depth for both primary and secondary tillage operations;

2) conduct more rigorous studies of the effects of slope gradient and curvature, tillage depth, and tillage ground speed on soil translocation and tillage erosion;

3) examine the effects of tillage tool shape and arrangement, tillage operator, and tractor-implement match on soil translocation and tillage erosion; and

4) examine soil translocation and tillage erosion under a broad range of soil conditions to determine the effects of soil texture and soil moisture content on soil translocation.

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APPENDIX A

Chemical and Physical Analysis of Muriate of Potash (KCl)

MURITE OF POTASH 0-0-62

Grade: Fine

Chemical and Physical Analysis:

	Typical
Potassium Oxide equivalent (K_2O)	62.4 %
Potassium Chloride (KCl)	98.8 %
Sodium Chloride (NaCl)	0.9 %
Calcium (Ca)	0.02 %
Magnesium (Mg)	0.01 %
Bromine (Br)	0.04 %
Sulphate (SO_4)	0.05 %
Water Insolubles	0.02 %
Moisture and Volatiles	0.08 %
Total Chloride (Cl)	47.56 %
Other	0.06 %

Trace Element Analysis:

Element	Concentration (PPM)
Silver (Ag)	< 0.05 %
Aluminum (Al)	< 0.05 %
Arsenic (As)	< 0.01 %
Boron (B)	0.17 %
Barium (Ba)	0.06 %
Beryllium (Be)	0.02 %
Cadmium (Cd)	0.01 %
Cobalt (Co)	< 0.05 %
Chromium (Cr)	< 0.05 %
Copper (Cu)	0.05 %
Iron (Fe)	0.16 %
Germanium (Ge)	0.06 %
Molybdenum (Mo)	< 0.05 %
Manganese (Mn)	< 0.05 %
Nickle (Ni)	0.06 %
Lead (Pb)	0.20 %

MURIATE OF POTASH 0-0-62 cont'd.

Antimony (Sb)	0.02 %
Strontium (Sr)	1.9 %
Tantalum (Ta)	< 1.0 %
Titanium (Ti)	< 0.05 %
Uranium (U)	< 1.0 %
Vanadium (V)	< 0.05 %
Tungsten (W)	< 1.0 %
Zinc (Zn)	0.2 %
Zirconium (Zr)	< 0.2 %
Silicon ($Si\ O_2$)	1.03 %

Screen Analysis:

Tyler Mesh	Typical
20	Nil
28	1
35	11
48	43
65	79
80	88
100	95

Bulk Density:

Loose	72 lb./ft.^{3}
Packed	79 lb./ft.^{3}

Angle of Repose: 26 - 28°

Solubility:

Temperature (°C)	Solubility of Kalium fine grade (g/100g of water)
10	31.0
20	34.3
25	35.8
30	37.4

Packaging: 25kg paper bag.

APPENDIX B

Description of Instrumentation Mounted on Tillage Equipment Used to Monitor Ground Speed and Slope Gradient

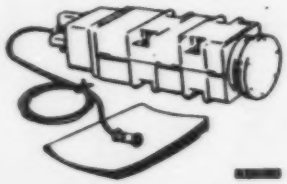
Additional monies to the original contract were acquired to develop a instrumentation system to accurately and precisely measure tillage implement ground speed, tractor inclination, tillage implement inclination, and tillage depth as the tillage equipment moved throughout the landscape. Continuous output from two radar guns, mounted on either side of the tractor, one directed forward and one directed to the rear, and two dual axel inclinometers, one mounted on the tractor and one mounted on the tillage implement, was collected using a Campbell Scientific 21X Data Logger. A simple switching system provided markers in the data corresponding to plot positions. Ground speed measurements were considered to be accurate and precise. Measurements of inclination were confounded by the unregulated voltage source. The internal power source rapidly decreased in voltage due to the high power consumption of the radar guns. Detailed elevation surveys are considered to be a better method of analyzing topography. A method for measuring tillage depth is still in the developmental stages.

This tillage instrumentation system is currently being used with the tillage systems operated on the Murray Lobb and Don Lobb Tillage-2000 field sites. Resident Cs^{137} radioactivity measurements at two these field sites were used to estimate the rates, and determine the patterns, of soil loss within each landscape. Estimates of soil loss rates exceeded 100 t ha^{-1} yr^{-1} on the eroded upper slope landscape positions within each field. It is anticipated that the information collected (ground speed) with the tillage instrumentation system will provide a better understanding of the processes which cause the excessive soil loss within the landscape. Detailed crop yield data was collected during the Tillage-2000 study, and continues to be collected on the D. Lobb site. This data may be used to examine the association between tillage erosion, soil loss and crop yield in future studies.

DICKEY-john CORPORATION

INSTALLATION INSTRUCTIONS

DICKEY-john DjRVS II RADAR VELOCITY SENSOR



DjRVS II SENSOR KIT

1. DjRVS II Sensor
2. Installation Instructions

DjRVS II MOUNTING BRACKET KIT

1. Mounting Bracket
2. U-Bolts 1 1/8" x 2" x 1/4 - 20 (2)
3. 1/4" Split Ring Lockwashers (8)
4. 1/4" Flatwashers (8)
5. 1/4 - 20 x 4" Bolts (4)
6. 1/4 - 20 Nuts (8)

PLATE MOUNTING BRACKET

Customer fabricated mounting plate (see dimensional drawing in Section A. PLATE MOUNTING BRACKET).

DjRVS II "L" PIPE MOUNTING BRACKET KIT

1. "L" Pipe Mounting Bracket
2. 3/8 - 16 x 1 1/2" Bolts (2)
3. 3/8 Split Ring Lockwashers (2)
4. 3/8 Nuts (2)

The DjRVS II can be mounted several ways. The mounting kits are designed to give the user the option of fabricating his own mounting bracket, retrofitting to an existing DjRVS I "L" pipe mounting bracket, or using "L" shaped pipe and mounting bracket kits purchased from DICKEY-john for new installations.

Specifications subject to change without notice
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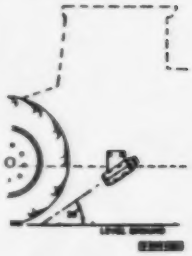
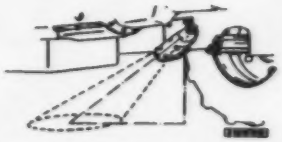
SELECTING MOUNTING LOCATION



1. Refer to the above illustration and park the vehicle on level ground. This is necessary in order to install the sensor at the proper angle with respect to ground.

2. The following list describes some of the precautions which should be followed when selecting a mounting location.



a. The face of the sensor will have an unobstructed view of the ground.

The area that must remain unobstructed is cone shaped from the face of the sensor to the ground as shown. The pattern of the sensor signal on the ground is oval shaped due to the installation angle. The size of the oval pattern is dependent on the height the sensor is above the ground. The following is the pattern size for the indicated height.

SENSOR HEIGHT	PATTERN SIZE (OVAL)
18 inches	18.8 x 12.7 inches
24 inches	24.17 x 17.2 inches
48 inches	31.0 x 25.8 inches

b. Fluids do not drip on sensor face area.

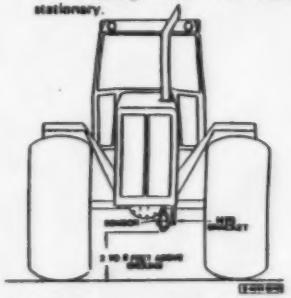
c. The sensor is away from all heat sources.

d. The sensor face or rear metal housing does not touch the vehicle.

e. The sensor is protected from stubble and debris.

f. It is recommended that the sensor be installed facing to the rear of the vehicle. NOTE: There may be instances where the sensor will have to be oriented facing forward, but rear facing is preferred to offer more physical protection to the radar sensor.

g. The sensor mounting location must have a minimal amount of vibration; excessive vibration may cause erroneous MPH readings with the vehicle stationary.



NOTE: Care must be exercised when selecting mounting heights of more than four feet. The sensor must have an unobstructed cone shaped view of the ground. If a vehicle tire, hose, or liquid line is within the cone shaped area, erroneous readings may result.

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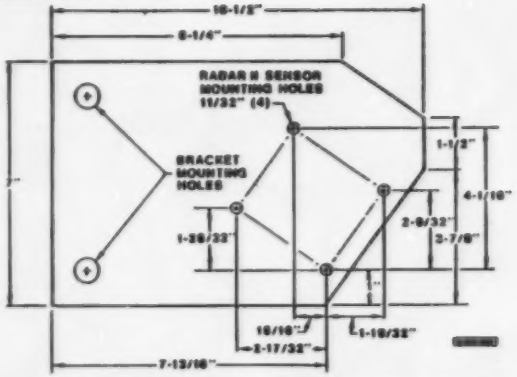
A. PLATE MOUNTING BRACKET
(fabricated by user)



1. Shown above is a dimensional drawing of the plate mounting bracket, which may be fabricated by the installer. The mounting plate must be made out of 5/16 inch steel plate. **IMPORTANT:** Using steel plate less than 5/16 inch may allow the radar velocity sensor to vibrate which could cause erroneous MPH(kph) readings.

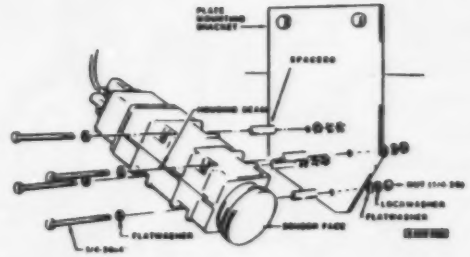
Refer to the above illustration and make the flat plate mounting bracket as shown. **NOTE:** The most critical dimensions are the placement of the four Radar II Sensor mounting holes. However, these holes may be ovaled out if they are not drilled in the exact location.

Suggested mounting hardware is as follows.

1. 3/8 16 x 1-1/2" Bolts (2)
2. 3/8 Split Ring Lockwashers (2)
3. 3/8 Nuts (2)
4. 1/4 - 20 x 4" Bolts, SST (4)
5. 1/4 Flatwashers, SST (8)
6. 1/4 - 20 Nuts, SST (4)
7. 1/4 Split Ring Lockwashers, SST (4)
8. 9/32" x 1/2" x 9/10" Spacers (4)
   (Dj Part No. 45840-4110)

IMPORTANT: MAKE CERTAIN THE MOUNTING PLATE DOES NOT EXTEND PAST THE SENSOR HOUSING. METAL BESIDE THE FACE AREA CAN CAUSE IMPROPER OPERATION OF THE SENSORS.

IMPORTANT: MAKE CERTAIN THAT THE METAL REAR HOUSING OF THE SENSOR DOES NOT COME IN CONTACT WITH THE VEHICLE FRAME OR THE MOUNTING BRACKET. Such contact can cause erratic readings by introducing electrical noise into the sensor. Under certain circumstances, such contact may cause electrical damage to the sensor.



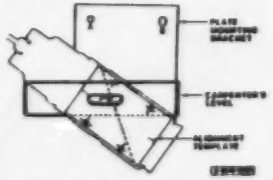
2. Refer to the above illustration and install the DjRVS II Sensor on the flat plate mounting bracket as shown with the enclosure seam on the side. Make certain spacers are installed as shown.

CAUTION

DO NOT EXCEED 30–35 LB–IN (3.0–3.6 N.M.) OF TORQUE WHEN TIGHTENING THE FOUR 1/4-20x4" BOLTS SECURING THE RADAR II TO THE MOUNTING BRACKET.

OVER TIGHTENING MAY FRACTURE THE RADAR II SENSOR HOUSING.

NOTE: When installing the DjRVS II Radar Velocity Sensor MAKE CERTAIN THE SEAM IN THE SENSOR HOUSING IS MOUNTED IN THE HORIZONTAL PLANE AS ILLUSTRATED ABOVE.



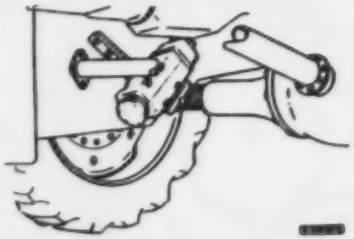
3. Refer to the above illustration and initially drill out the "A" mounting hole. Install a 3/8 inch bolt, lockwasher and nut. Tighten the bolt enough so the mounting plate will hold position without slipping. Tape the alignment template to the radar and using a small carpenter's level rotate the mounting plate until the dotted line on the template is level. Drill out the "B" mounting hole.

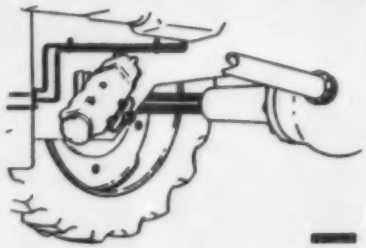
NOTE: If required, the "B" mounting hole can be ovaled out to provide the rotation necessary to adjust the radar angle.

B. PIPE MOUNTING BRACKET KITS

The mounting bracket kit consists of a mounting plate, two U bolts with lockwashers and nuts, and four 1/4 – 20 x 4 inch bolts with lockwashers and nuts. This kit is used to install the DjRVS II on the "L" pipe mounting bracket. If the pipe mounting bracket is not already installed, proceed as follows; If it is, proceed to Step 3.

TYPICAL MOUNTING LOCATIONS:



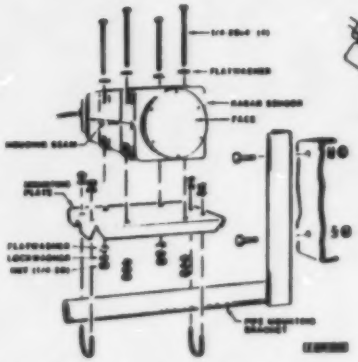


1. Select a location (on inside of main frame when possible) to install the sensor "L" pipe mounting bracket. If possible, select a location where two existing bolts can be used and drill matching holes in the angle iron on the pipe mounting bracket. The three preceding illustrations show some typical mounting positions.

2. If two existing bolts are not at the selected location, drill two holes in the mounting surface and two matching holes in the angle iron on the pipe mounting bracket (check opposite side of drilling surface for wires, hoses, etc.). Before installing the pipe mounting bracket, make certain the sensor can be positioned over the pipe extending from the bracket. If not, the sensor will have to be installed on the pipe before the mounting bracket is secured to the mounting surface.

IMPORTANT: Welding the bracket to the mounting surface is **NOT RECOMMENDED.** Excessive frame vibration may necessitate the relocating of the mounting bracket to a more stable location. Also, do not weld bracket in location that inhibits the removal of the sensor.

CAUTION: IF, AT ANY TIME, AN ARC WELDER IS USED ON THE VEHICLE OR ANYTHING CONNECTED TO THE VEHICLE, DISCONNECT ALL POWER AND GROUND LEADS WHICH PROVIDE POWER FOR THE SYSTEM. FAILURE TO DO SO CAN RESULT IN DAMAGED ELECTRONIC COMPONENTS, IN WHICH CASE THE WARRANTY WILL BE VOID.



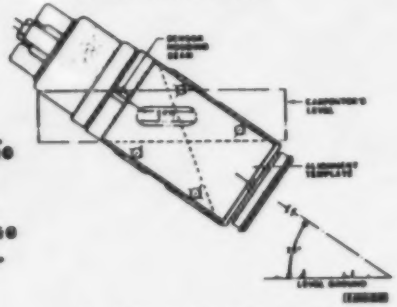
3. Refer to the above illustration and install the sensor mounting hardware as shown. Make sure the sensor is above the pipe with its face towards the rear of the vehicle and the enclosure seam on the side. Tighten the four bolts holding the sensor to the mounting plate. Tighten U-bolts until the sensor will hold position but can still be adjusted as needed on the pipe.

CAUTION

DO NOT EXCEED 30–35 LB–IN (3.0–3.5 N.M.) OF TORQUE WHEN TIGHTENING THE FOUR 1/4 20x4" BOLTS SECURING THE RADAR II TO THE MOUNTING BRACKET.

OVER TIGHTENING MAY FRACTURE THE RADAR II SENSOR HOUSING.

NOTE: When installing the DJRVS II Radar Velocity Sensor MAKE CERTAIN THE SEAM IN THE SENSOR HOUSING IS MOUNTED IN THE HORIZONTAL PLANE AS ILLUSTRATED ABOVE.



4. Refer to the above illustration and install the sensor angle setting template (template is located at rear of instruction) on the side of the radar sensor as shown. Make certain the short solid lines are lined up with the sensor housing seam. Tape template in place. Using a level as shown, rotate the sensor on the mounting pipe until the dotted line on the template is level. Tighten the mounting hardware. **NOTE:** The vehicle must be on level ground when the angle is set.

IMPORTANT: Make certain that the metal rear housing of the sensor does not come in contact with the vehicle frame or the mounting bracket. Such contact can cause erratic readings by introducing electrical noise into the sensor. Under the proper circumstances, such contact may cause electrical damage to the sensor.

5. Route the sensor cable to the location of the console radar cable connector. **NOTE:** Do not secure the cable until the sensor has been checked for vibration. Excessive vibration may cause ground speed (MPH) readings to be above zero when the vehicle is stationary. To check for vibration, start vehicle engine and slowly increase engine RPM (while watching the ground speed readout) to approximately 1800. If the ground speed readings are above zero, the sensor must be mounted in an alternate, more stable location. After the sensor readings have been checked and found to be stable, secure the sensor cable where it will not be damaged.

NOTES:

1. When the sensor is installed and the system is operational, the sensor or console must be calibrated.

   Refer to the Installation and Operation Manual of your monitor console and perform the ground speed (distance) calibration procedure as described.

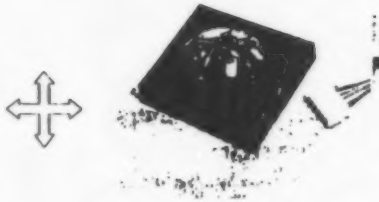
AccuStar® II
Dual Axis Clinometer

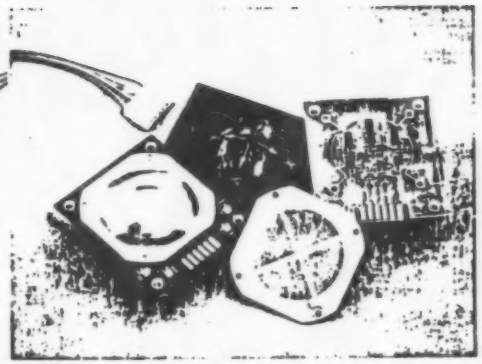
AccuStar® II combines the function of two clinometers in one package. The unique, dome shaped design features a capacitance based sensor which produces an output signal directly proportional to the rotation tilt in two axes.

Designed for high volume applications, AccuStar® II is priced to compete with much less capable mercury switches and other low cost level sensors.

Performance

Resolution	0.01°
Range	± 20°

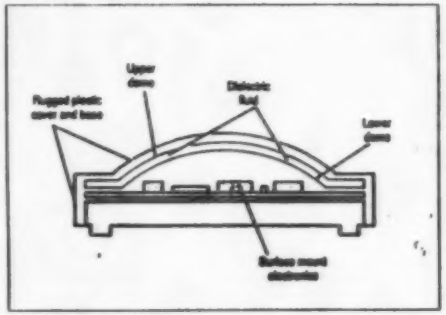




Adaptable design

The simplicity of the design concept makes it possible to adapt the basic sensor to almost any configuration. The unit can be provided with or without a cover. The circuit board is available with or without aluminum mounting legs. The molded cover assembly is sealed with a silicone rubber compound to protect the sensor and electronics.

The majority of the surface mount circuitry is contained underneath the dome. The only electronics located outside the dome area are four potentiometers which provide scale factor and null adjustments. There are six input and output connections located on the card edge connector providing a choice of ratiometric analog or pulse width (PW) digital output. A mating connector (sold separately) provides the user with an easy plug in connection.



Cutaway view of the AccuStar® II illustrates the simple design concept (patent pending)

Design concept

Physically the sensor is composed of two hermetically sealed domes spaced about 1/8" apart. The lower, polyester plastic dome has 4 capacitance plates while the aluminum, upper dome acts as a ground. A fluid with a high dielectric constant is sealed within the dome sandwich, leaving an air bubble about the size of a quarter. The bubble is centered at level position and will, of course, move from one side to the other as the device is tilted.

The secret is under the dome

The underside of the lower dome is divided into four conductive quadrants. A pair of quadrants, opposed to each other, are used to sense position in one axis while the opposite pair is used for the other axis.

When you tilt the sensor, the bubble, moving under the force of gravity changes the capacitance. The resulting differential generates an output signal which accurately reflects the rotation tilt of the device in either x or y axis. The pin selectable output signal provides both pulse width modulation or a DC analog voltage output.

View looking down at the top of the dome depicts the moving bubble and the four conductive quadrants.

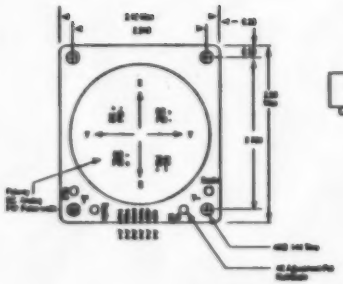
Specifications

Performance	
Range	±20°
Threshold/resolution	0.01°
Linearity	
Null to 10°	±0.2°
10° to 15°	2% of reading
15° to 20°	Monotonic
Null repeatability	±0.1°
Time constant	0.3 second
Frequency response (-3dB)	0.5 Hz
Environmental	
Temperature range	
Operating	-40° to +85°C
Storage	-55° to +85°C
Temperature coefficient of null	0.01° per °C
Temperature coefficient of scale factor	0.10 % per °C
Electrical	
Voltage supply nominal	+9 VDC (12VDC)
Voltage supply range	Regulated +5.0 VDC to +15.0 VDC
Current	3.5 milliamps maximum
Analog Output	
Scale factor @ +9 VDC	100 millivolts per degree
Load resistance	10K ohms minimum
Pulse Width Output	
Null	50%
Scale factor	0.7% per° to 14 µs per degree nominal
Duty cycle	$t_1/(t_1 + t_2)$
	t_1 and t_2 varies from 0.2 to 0.7 ms
Frequency	≈ 1 kHz nominal

Dimensions

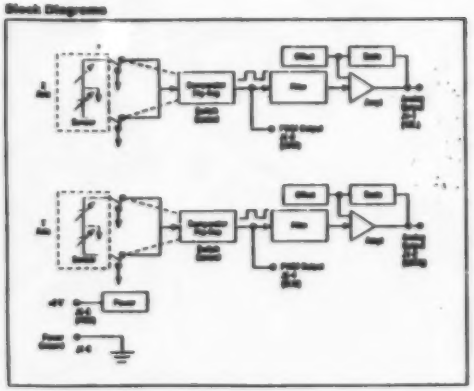
Side View

Top View



Horizontal Mounting - Standard

Block Diagram



Dual axis digital output

The times t_1 and t_2 are proportional to the sensor capacitance. As the sensor is rotated, t_1 increases or decreases and t_2 decreases or increases.

Pulse width ratio: $R = t_1/(t_1 + t_2)$

At null when $t_1 = t_2$ $R = 50\%$

At +1° rotation $R = 50.70\%$

At +20° rotation $R = 64.0\%$

At -1° rotation $R = 49.30\%$

At -20° rotation $R = 36.2\%$

APPENDIX C

Experimental Data Including Soil Bulk Density, Soil Moisture Content, Chloride Content, Pulse Response Distributions, and Soil Translocation Calculations from Tillage Implement Experiments

Soil samples were collected in the field for the determination of soil bulk density, gravimetric soil moisture content, and soil chloride content. This data was utilized to generate pulse response distributions (PRD) and synthetic step response distributions (SSRD) to calculate soil volume translocation and soil mass translocation (see Section 4.3). The method of sample collection and analysis is given in Section 3 entitled "Materials and Methods". Manual field measurements of tillage depth and till layer depth were also conducted. The field samples and measurements for the primary tillage implements were collected during the 1990 field season. The field samples and measurements for the secondary tillage implements were collected during the 1991 field season. Laboratory analysis of chloride content was conducted piecemeal over the duration of the study when the TRAACS was available. This resulted in some unintentional and some intentional replication of soil chloride content analysis. Upon the examination of the replicated data, and water and chloride standards, it became evident that the analysis was inaccurate. Upon examination of the method of analysis it became evident that the protocol for analysis was incorrect throughout the duration of the study. A linear-fit method for standard calibration, and baseline, gain, and carry-over correction was used with the TRAACS rather than the more accurate piecewise-fit method. It was possible to manually correct the data for a piecewise standard calibration. It is believed that this laborious procedure greatly improved the accuracy of the data and the results.

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extrated 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
1 1 1	1	13.19	11.89		31.42	28.33	0.109	5.021	11.2	0.1	1.3	0.2	0.02					
	2	16.93	15.26	27.15	30.89	27.85	0.109	5.046	60.6	51.4	464.4	70.9	7.09	7.10	0.067	0.067	Bulk Density at to (kg/m3)	= 1453
2	1	13.04	11.70		30.55	27.43	0.114	5.047	91.7	110.0	993.4	116.3	11.63					
	2	15.74	14.03	25.73	32.68	29.13	0.122	5.054	150.3	165.4	1492.0	209.3	20.93	32.55	0.306	0.373	Background Cl (g/m2)	= 0
3	1	15.73	14.05		31.34	28.00	0.119	5.033	133.1	150.4	1361.8	191.3	19.13					
	2	17.00	15.20	29.25	31.70	28.35	0.118	5.037	130.4	147.9	1338.5	203.4	20.34	39.47	0.371	0.744	Cl Added to Plot (g)	= 237.5
4	1	15.73	13.94		34.90	30.93	0.128	5.027	95.4	113.8	1031.9	143.8	14.38					
	2	14.94	13.35	27.29	31.10	27.80	0.119	5.058	46.8	28.8	259.6	34.7	3.47	17.85	0.168	0.912	Total Cl Measured at ti (g)	= 106.4
5	1	13.97	12.47		33.50	29.91	0.120	5.072	43.1	23.8	213.8	26.7	2.67					
	2	18.62	16.66	29.13	30.80	27.57	0.117	5.045	31.8	11.5	103.6	17.3	1.73	4.39	0.041	0.953	Added Cl Recovered at ti (g)	= 106.4
6	1	14.16	12.67		35.31	31.60	0.117	5.048	27.7	8.1	72.9	9.2	0.92					
	2	16.54	14.81	27.47	32.71	29.29	0.117	5.078	22.9	4.8	43.2	6.4	0.64	1.56	0.015	0.968	Cl Recovery Ratio	= 0.448
7	1	20.74	18.54		31.31	28.00	0.118	5.071	31.0	10.7	96.6	17.9	1.79					
	2	12.16	10.92	29.46	29.16	26.19	0.113	5.061	17.6	2.1	19.3	2.1	0.21	2.00	0.019	0.986	Cl Translocated from Plot (g)	= 66.7
8	1	13.43	12.04		31.12	27.90	0.115	5.070	18.2	2.4	21.2	2.6	0.26					
	2	13.50	12.04	24.08	30.20	26.95	0.121	5.073	22.5	4.6	41.1	5.0	0.50	0.75	0.007	0.993	Cl Not Translocated (g)	= 39.7
9	1	15.75	14.11		30.19	27.06	0.116	5.094	17.4	2.1	18.4	2.6	0.26					
	2	17.68	15.82	29.93	32.29	28.90	0.117	5.078	15.1	1.2	10.6	1.7	0.17	0.43	0.004	0.997	Soil Volume Translocated (m3)	= 0.019
10	1	16.16	14.54		32.02	28.81	0.111	5.043	13.2	0.6	5.4	0.8	0.08					
	2	14.23	12.77	27.31	32.70	29.36	0.114	5.067	16.4	1.7	14.9	1.9	0.19	0.27	0.003	1.000	Soil Mass Translocated (kg)	= 27.4
11				276.8	34.83	31.42	0.109	5.047	8.5	0.0	0.0			106.38	1.000			
1 2 1	1	17.57	15.78		34.11	30.65	0.113	5.024	73.7	80.7	731.7	115.5	11.55					
	2	17.88	16.01	31.80	33.41	29.92	0.116	5.035	74.3	81.4	736.8	118.0	11.80	23.35	0.180	0.180	Bulk Density at to (kg/m3)	= 1516
2	1	20.51	18.36		35.20	31.52	0.117	5.022	97.4	108.6	986.1	181.1	18.11					
	2	18.09	16.26	34.62	33.92	30.50	0.112	5.030	238.2	240.9	2182.9	355.0	35.50	53.61	0.413	0.593	Background Cl (g/m2)	= 0
3	1	19.90	17.92		33.59	30.25	0.110	5.031	143.6	154.1	1396.1	250.2	25.02					
	2	13.88	12.49	30.42	35.03	31.54	0.110	5.008	127.1	138.3	1258.7	157.3	15.73	40.75	0.314	0.907	Cl Added to Plot (g)	= 237.5
4	1	18.83	16.94		33.14	29.82	0.111	5.034	39.6	36.3	328.6	55.7	5.57					
	2	17.92	16.09	33.03	33.98	30.53	0.113	5.033	29.5	22.2	200.9	32.3	3.23	8.80	0.068	0.974	Total Cl Measured at ti (g)	= 129.8
5	1	17.97	16.22		40.20	36.29	0.108	5.021	11.0	2.0	18.3	3.0	0.30					
	2	17.15	15.43	31.65	34.45	31.01	0.111	5.017	24.1	14.7	133.8	20.7	2.07	2.36	0.018	0.993	Added Cl Recovered at ti (g)	= 129.8
6	1	13.57	12.25		34.26	30.93	0.108	5.038	8.4	0.8	7.5	0.9	0.09					
	2	10.79	9.71	21.96	32.71	29.46	0.110	5.039	11.8	2.5	22.5	2.2	0.22	0.31	0.002	0.995	Cl Recovery Ratio	= 0.547
7	1	16.99	15.29		41.11	37.01	0.111	5.012	7.3	0.5	4.4	0.7	0.07					
	2	17.54	15.79	31.08	36.57	32.93	0.110	5.031	9.3	1.2	10.9	1.7	0.17	0.24	0.002	0.997	Cl Translocated from Plot (g)	= 77.0
8	1	20.57	18.55		34.40	31.02	0.109	5.016	5.9	0.1	1.1	0.2	0.02					
	2	16.50	14.85	33.39	34.03	30.63	0.111	5.021	10.0	1.5	14.0	2.1	0.21	0.23	0.002	0.999	Cl Not Translocated (g)	= 52.9
9	1	16.43	14.81		38.46	34.67	0.109	5.015	5.5	0.0	0.3	0.0	0.00					
	2	12.04	10.82	25.63	33.85	30.44	0.112	5.013	9.0	1.1	9.7	1.0	0.10	0.11	0.001	1.000	Soil Volume Translocated (m3)	= 0.011
10	1	16.70	15.01		35.19	31.64	0.112	5.012	7.3	0.5	4.3	0.6	0.06					
	2	18.42	16.65	31.66	33.27	30.09	0.106	5.015	4.3	0.0	0.0	0.0	0.00	0.06	0.000	1.000	Soil Mass Translocated (kg)	= 16.6
11				305.2	37.13	33.51	0.108	5.014	6.2	0.2	1.7			129.81	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extrated 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
1 3 1 1	*	118.47	16.84		35.06	31.96	0.097	5.020	25.3	16.4	148.9	25.1	2.51					
2		17.65	16.01	32.85	35.09	31.85	0.102	5.019	67.5	73.2	664.8	106.4	10.64	13.15	0.103	0.103	Bulk Density at to (kg/m3)	= 1615
2 1		14.87	13.47		38.65	35.01	0.104	5.017	92.7	103.7	942.6	126.9	12.69					
2		19.62	17.87	31.33	35.05	31.93	0.098	5.017	157.2	166.8	1515.0	270.7	27.07	39.76	0.312	0.415	Background Cl (g/m2)	= 0
3 1		19.76	17.96		34.77	31.61	0.100	5.015	122.1	133.4	1212.5	217.8	21.78					
2		20.36	18.50	36.46	36.01	32.74	0.100	5.009	131.6	142.7	1298.1	240.2	24.02	45.79	0.359	0.774	Cl Added to Plot (g)	= 237.5
4 1		20.77	18.99		33.95	31.05	0.093	5.022	44.0	43.6	395.3	75.1	7.51					
2		14.93	13.62	32.62	34.96	31.91	0.095	5.010	92.6	103.6	942.6	128.4	12.84	20.35	0.160	0.933	Total Cl Measured at ti (g)	= 127.6
5 1		21.14	19.27		36.79	33.55	0.097	5.010	25.8	17.1	156.0	30.1	3.01					
2		20.70	18.82	38.09	35.16	31.97	0.100	5.016	30.1	23.0	209.0	39.3	3.93	6.94	0.054	0.988	Added Cl Recovered at ti (g)	= 127.6
6 1		21.32	19.40		35.21	32.04	0.099	5.020	12.3	2.8	25.1	4.9	0.49					
2		16.47	14.90	34.30	35.60	32.22	0.105	5.020	11.5	2.3	20.9	3.1	0.31	0.80	0.006	0.994	Cl Recovery Ratio	= 0.537
7 1		23.76	21.57		36.40	33.05	0.101	5.020	8.9	1.0	9.3	2.0	0.20					
2		19.61	17.74	39.31	35.67	32.28	0.105	5.020	9.3	1.2	11.0	2.0	0.20	0.40	0.003	0.997	Cl Translocated from Plot (g)	= 52.9
8 1		18.13	16.43		33.15	30.05	0.103	5.010	6.3	0.2	1.8	0.3	0.03					
2		21.52	19.42	35.85	32.98	29.77	0.108	5.020	8.3	0.8	7.5	1.5	0.15	0.17	0.001	0.999	Cl Not Translocated (g)	= 74.6
9 1		20.61	18.60		34.78	31.39	0.108	5.010	7.4	0.5	4.6	0.8	0.08					
2		19.60	17.74	36.34	35.23	31.90	0.104	5.010	5.5	0.0	0.3	0.0	0.00	0.09	0.001	0.999	Soil Volume Translocated (m3)	= 0.016
10 1		16.06	14.56		34.85	31.60	0.103	5.020	7.6	0.6	5.2	0.8	0.08					
2		22.20	19.99	34.55	37.00	33.33	0.110	5.020	6.0	0.1	1.2	0.2	0.02	0.10	0.001	1.000	Soil Mass Translocated (kg)	= 26.6
11				351.7	35.15	31.76	0.107	5.010	5.4	0.0	0.2			127.56	1.000			
1 4 1 1		19.45	17.74		31.73	28.94	0.096	5.031	74.0	81.1	734.8	130.3	13.03					
2		13.83	12.67	30.41	36.67	33.60	0.091	5.026	94.4	105.5	956.6	121.2	12.12	25.15	0.169	0.169	Bulk Density at to (kg/m3)	= 1727
2 1		19.11	17.46		33.36	30.49	0.094	5.023	174.7	182.5	1656.5	289.2	28.92					
2		18.76	17.16	34.62	34.94	31.97	0.093	5.023	125.0	136.3	1236.4	212.1	21.21	50.14	0.337	0.505	Background Cl (g/m2)	= 0
3 1		19.58	17.84		35.99	32.79	0.097	5.012	108.6	120.0	1091.2	194.7	19.47					
2		15.12	13.80	31.63	35.40	32.31	0.096	5.021	94.3	105.5	957.3	132.1	13.21	32.67	0.219	0.725	Cl Added to Plot (g)	= 237.5
4 1		18.81	17.11		37.31	33.94	0.099	5.029	56.6	60.3	546.4	93.5	9.35					
2		16.63	15.19	32.30	34.07	31.13	0.095	5.033	52.9	56.0	507.2	77.0	7.70	17.05	0.114	0.839	Total Cl Measured at ti (g)	= 149.0
5 1		15.58	14.31		37.38	34.34	0.089	5.033	24.2	14.8	134.4	19.2	1.92					
2		18.65	17.13	31.44	32.33	29.71	0.088	5.028	27.6	20.0	181.3	31.1	3.11	5.03	0.034	0.873	Added Cl Recovered at ti (g)	= 149.0
6 1		19.64	17.95		36.61	33.46	0.094	5.010	20.3	9.6	87.7	15.7	1.57					
2		17.10	15.67	33.62	32.44	29.74	0.091	5.023	30.9	28.4	257.4	40.3	4.03	5.61	0.038	0.911	Cl Recovery Ratio	= 0.627
7 1		18.16	16.59		37.46	34.23	0.095	5.023	22.5	14.2	129.0	21.4	2.14					
2		17.66	16.03	32.62	35.55	32.28	0.101	5.030	23.7	17.3	156.6	25.1	2.51	4.65	0.031	0.942	Cl Translocated from Plot (g)	= 75.3
8 1		20.54	18.77		34.01	31.08	0.094	5.026	21.1	11.1	100.8	18.9	1.89					
2		19.48	17.66	36.43	35.54	32.23	0.103	5.026	22.7	14.7	132.9	23.5	2.35	4.24	0.028	0.970	Cl Not Translocated (g)	= 73.7
9 1		22.79	20.76		34.86	31.77	0.097	5.025	19.7	8.4	76.4	15.9	1.59					
2		17.04	15.44	36.21	32.56	29.52	0.103	5.025	17.8	5.0	45.0	6.9	0.69	2.28	0.015	0.986	Soil Volume Translocated (m3)	= 0.019
10 1		21.46	19.66		33.99	31.11	0.093	5.011	18.3	5.8	53.2	10.4	1.04					
2		22.95	20.75	40.39	31.23	28.24	0.106	5.018	18.3	5.8	52.7	10.9	1.09	2.14	0.014	1.000	Soil Mass Translocated (kg)	= 33.4
11				339.7	35.95	32.69	0.100	5.016	9.5	1.3	11.9			148.96	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extrated 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
1 5 1	1	18.86	17.99		38.58	36.80	0.048	5.007	26.2	21.8	198.1	35.6	3.56					
	2	17.90	16.98	34.97	40.18	38.13	0.054	5.027	75.0	86.2	781.7	132.7	13.27	16.84	0.096	0.096	Bulk Density at to (kg/m3)	= 1784
2	1	24.17	23.01		37.90	36.09	0.050	5.013	97.9	111.3	1011.7	232.8	23.28					
	2	18.59	17.50	40.52	38.03	35.82	0.062	5.015	155.2	166.5	1513.5	264.9	26.49	49.77	0.283	0.378	Background Cl (g/m2)	= 0
3	1	21.32	20.06		35.59	33.50	0.062	5.015	88.7	101.8	925.1	185.6	18.56					
	2	17.71	16.71	36.77	39.41	37.19	0.060	5.003	56.0	64.3	586.3	98.0	9.80	28.36	0.161	0.539	Cl Added to Plot (g)	= 237.5
4	1	20.77	19.47		41.43	38.85	0.067	5.009	83.1	95.5	869.3	169.2	16.92					
	2	17.00	16.00	35.46	41.58	39.14	0.062	5.012	55.5	63.8	580.4	92.8	9.28	26.21	0.149	0.688	Total Cl Measured at ti (g)	= 176.1
5	1	14.88	13.94		32.76	30.70	0.067	5.005	32.2	30.4	276.5	38.5	3.85					
	2	18.81	17.66	31.60	40.64	38.17	0.065	5.010	58.1	66.7	607.2	107.2	10.72	14.58	0.083	0.771	Added Cl Recovered at ti (g)	= 176.1
6	1	18.53	17.27		36.72	34.23	0.073	5.021	29.3	26.1	236.7	40.9	4.09					
	2	20.07	18.80	36.07	41.29	38.69	0.067	5.012	39.5	42.5	386.1	72.6	7.26	11.35	0.064	0.835	Cl Recovery Ratio	= 0.742
7	1	22.38	20.90		38.46	35.93	0.070	5.027	62.6	71.9	651.8	136.3	13.63					
	2	20.67	19.28	40.18	37.31	34.81	0.072	5.015	35.1	35.0	318.3	61.4	6.14	19.76	0.112	0.947	Cl Translocated from Plot (g)	= 66.6
8	1	23.90	22.27		40.41	37.66	0.073	5.018	23.2	16.0	145.7	32.5	3.25					
	2	18.37	17.08	39.35	35.85	33.34	0.075	5.015	19.2	7.5	68.1	11.6	1.16	4.41	0.025	0.972	Cl Not Translocated (g)	= 109.5
9	1	17.21	15.94		36.25	33.58	0.079	5.017	21.9	12.9	117.6	18.7	1.87					
	2	24.26	22.48	38.42	43.35	40.17	0.079	5.017	18.6	6.3	57.5	12.9	1.29	3.17	0.018	0.990	Soil Volume Translocated (m3)	= 0.028
10	1	23.12	21.40		35.49	32.86	0.080	5.014	16.8	3.5	31.5	6.7	0.67					
	2	18.52	17.12	38.52	36.15	33.42	0.082	5.007	18.6	6.4	58.6	10.0	1.00	1.68	0.010	1.000	Soil Mass Translocated (kg)	= 50.2
11				371.9	36.38	33.45	0.088	5.008	19.7	8.5	77.0			176.11	1.000			
1 6 1	1	15.89	14.75		34.43	31.98	0.077	5.012	71.5	82.2	747.1	110.2	11.02					
	2	19.16	17.75	32.51	34.93	32.38	0.079	5.012	45.1	51.8	471.0	83.6	8.36	19.39	0.131	0.131	Bulk Density at to (kg/m3)	= 1720
2	1	20.08	18.69		35.05	32.62	0.074	5.011	124.7	138.0	1255.6	234.6	23.46					
	2	17.77	16.57	35.26	34.14	31.85	0.072	5.021	137.2	150.0	1361.4	225.6	22.56	46.02	0.311	0.442	Background Cl (g/m2)	= 0
3	1	19.49	18.12		37.45	34.83	0.075	5.013	105.3	118.8	1080.6	195.8	19.58					
	2	18.43	17.28	35.40	36.65	34.38	0.066	5.013	99.3	112.7	1025.1	177.1	17.71	37.30	0.252	0.695	Cl Added to Plot (g)	= 237.5
4	1	20.11	18.83		37.52	35.13	0.068	5.013	63.5	73.0	663.3	124.9	12.49					
	2	17.17	16.04	34.86	38.03	35.53	0.070	5.015	58.2	66.8	607.5	97.4	9.74	22.23	0.150	0.845	Total Cl Measured at ti (g)	= 147.8
5	1	19.66	18.33		35.79	33.38	0.072	5.010	35.8	36.1	328.2	60.2	6.02					
	2	19.66	18.32	36.65	34.77	32.41	0.073	5.017	29.2	25.9	235.4	43.1	4.31	10.33	0.070	0.915	Added Cl Recovered at ti (g)	= 147.8
6	1	18.39	17.18		40.33	37.70	0.070	5.008	23.8	17.4	158.2	27.2	2.72					
	2	21.92	20.50	37.68	40.38	37.76	0.069	5.015	23.2	15.9	144.1	29.5	2.95	5.67	0.038	0.953	Cl Recovery Ratio	= 0.622
7	1	20.10	18.83		36.55	34.24	0.067	5.020	34.0	0.0	0.0	0.0	0.00					
	2	18.66	17.32	36.14	37.01	34.35	0.077	5.016	20.7	10.3	94.0	16.3	1.63	1.63	0.011	0.964	Cl Translocated from Plot (g)	= 65.4
8	1	20.12	18.75		40.56	37.81	0.073	5.021	17.6	4.8	43.3	8.1	0.81					
	2	21.92	20.34	39.09	36.91	34.26	0.077	5.016	18.2	5.8	52.4	10.7	1.07	1.88	0.013	0.977	Cl Not Translocated (g)	= 82.4
9	1	19.64	18.34		37.92	35.42	0.071	5.007	16.7	3.3	29.9	5.5	0.55					
	2	21.19	19.65	37.99	38.01	35.26	0.078	5.017	19.3	7.7	69.9	13.7	1.37	1.92	0.013	0.990	Soil Volume Translocated (m3)	= 0.020
10	1	21.09	19.67		37.17	34.67	0.072	5.012	16.5	3.0	27.4	5.4	0.54					
	2	21.21	19.70	39.37	36.35	33.78	0.076	5.015	17.9	5.2	47.0	9.3	0.93	1.47	0.010	1.000	Soil Mass Translocated (kg)	= 33.6
11				365.0	39.77	36.55	0.088	5.024	17.2	4.1	37.4			147.83	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extrated 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	------Laboratory Measurements------ Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
1 7	1 1	17.30	15.91		33.83	31.13	0.087	5.023	92.5	105.7	959.1	152.6	15.26					
	2	20.45	18.78	34.69	32.62	29.96	0.089	5.047	119.5	133.0	1201.0	225.5	22.55	37.81	0.252	0.252	Bulk Density at to (kg/m3)	= 1660
	2 1	18.18	16.76		30.40	28.04	0.084	5.039	130.3	143.4	1297.4	217.5	21.75					
	2	13.90	12.80	29.57	31.73	29.24	0.085	5.027	183.5	191.1	1732.7	221.9	22.19	43.94	0.293	0.546	Background Cl (g/m2)	= 0
	3 1	17.43	16.09		31.34	28.93	0.083	5.021	97.6	111.0	1007.4	162.0	16.20					
	2	17.27	15.95	32.03	31.47	29.07	0.083	5.031	95.5	108.9	986.2	157.3	15.73	31.93	0.213	0.759	Cl Added to Plot (g)	= 237.5
	4 1	18.40	16.96		31.73	29.26	0.084	5.038	42.5	48.1	435.4	73.9	7.39					
	2	15.63	14.49	31.45	33.22	30.80	0.079	5.043	37.4	38.9	351.3	50.9	5.09	12.48	0.083	0.842	Total Cl Measured at ti (g)	= 149.8
	5 1	14.52	13.38		34.13	31.45	0.085	5.047	20.5	10.0	90.7	12.1	1.21					
	2	19.65	18.20	31.58	31.45	29.14	0.079	5.051	35.5	35.7	322.0	58.6	5.86	7.07	0.047	0.889	Added Cl Recovered at ti (g)	= 149.8
	6 1	18.83	17.43		38.10	35.27	0.080	5.014	21.1	11.2	101.8	17.7	1.77					
	2	17.07	15.70	33.13	33.27	30.61	0.087	5.029	26.0	21.5	194.9	30.6	3.06	4.83	0.032	0.921	Cl Recovery Ratio	= 0.631
	7 1	18.04	16.66		34.03	31.44	0.082	5.031	20.9	10.7	97.1	16.2	1.62					
	2	17.95	16.62	33.28	31.76	29.41	0.080	5.027	22.4	14.0	127.0	21.1	2.11	3.73	0.025	0.946	Cl Translocated from Plot (g)	= 81.7
	8 1	14.83	13.77		34.24	31.80	0.077	5.044	23.7	17.3	156.4	21.5	2.15					
	2	19.21	17.73	31.50	33.14	30.59	0.083	5.029	21.6	12.4	112.1	19.9	1.99	4.14	0.028	0.974	Cl Not Translocated (g)	= 68.1
	9 1	19.85	18.35		33.76	31.21	0.082	5.045	19.6	8.1	73.4	13.5	1.35					
	2	16.44	15.27	33.62	31.87	29.62	0.076	5.042	18.9	6.9	62.8	9.6	0.96	2.31	0.015	0.989	Soil Volume Translocated (m3)	= 0.018
	10 1	19.24	17.78		36.01	33.29	0.082	5.022	17.6	4.7	43.1	7.7	0.77					
	2	15.17	14.06	31.84	35.60	33.00	0.079	5.023	18.7	6.6	60.1	8.5	0.85	1.61	0.011	1.000	Soil Mass Translocated (kg)	= 29.8
	11			322.7	31.15	28.68	0.086	5.046	16.7	3.3	29.6			149.85	1.000			
1 8	1 1	18.31	16.53		32.55	29.40	0.107	5.010	100.3	113.8	1035.0	171.1	17.11					
	2	20.50	18.60	35.13	30.50	27.68	0.102	5.010	74.5	85.6	779.1	144.9	14.49	31.60	0.157	0.157	Bulk Density at to (kg/m3)	= 1617
	2 1	20.79	18.69		34.71	31.21	0.112	5.010	213.1	217.4	1978.2	369.7	36.97					
	2	20.01	18.00	36.69	37.46	33.70	0.112	5.010	191.4	197.6	1798.0	323.6	32.36	69.33	0.344	0.501	Background Cl (g/m2)	= 0
	3 1	17.03	15.40		34.17	30.90	0.106	5.020	129.8	142.9	1297.9	199.8	19.98					
	2	19.66	17.69	33.08	36.55	32.89	0.111	5.020	190.6	197.0	1788.5	316.3	31.63	51.62	0.256	0.758	Cl Added to Plot (g)	= 237.5
	4 1	18.74	16.89		32.08	28.92	0.109	5.024	90.3	103.4	938.0	158.4	15.84					
	2	18.59	16.67	33.56	33.94	30.45	0.115	5.010	61.2	70.3	639.8	106.7	10.67	26.51	0.132	0.889	Total Cl Measured at ti (g)	= 201.4
	5 1	19.42	17.52		31.48	28.40	0.108	5.026	34.4	33.7	305.9	53.6	5.36					
	2	16.35	14.78	32.30	30.13	27.25	0.106	5.022	34.3	33.7	305.5	45.2	4.52	9.87	0.049	0.938	Added Cl Recovered at ti (g)	= 201.4
	6 1	15.51	13.96		34.25	30.84	0.111	5.026	23.0	15.5	140.5	19.6	1.96					
	2	19.66	17.80	31.77	32.08	29.06	0.104	5.027	25.4	20.7	188.0	33.5	3.35	5.31	0.026	0.965	Cl Recovery Ratio	= 0.848
	7 1	15.28	13.81		33.16	29.99	0.106	5.023	18.6	6.3	57.6	8.0	0.80					
	2	18.84	17.06	30.87	31.98	28.96	0.104	5.017	21.8	12.8	116.1	19.8	1.98	2.78	0.014	0.978	Cl Translocated from Plot (g)	= 100.9
	8 1	14.49	13.13		28.87	26.17	0.103	5.015	17.3	4.2	38.2	5.0	0.50					
	2	18.12	16.50	29.63	30.50	27.78	0.098	5.016	21.1	11.3	102.5	16.9	1.69	2.19	0.011	0.989	Cl Not Translocated (g)	= 100.4
	9 1	19.36	17.46		30.43	27.45	0.109	5.031	16.4	3.0	27.0	4.7	0.47					
	2	12.31	11.23	28.69	31.32	28.58	0.096	5.017	18.3	5.8	53.0	6.0	0.60	1.07	0.005	0.995	Soil Volume Translocated (m3)	= 0.016
	10 1	17.05	15.60		32.85	30.07	0.092	5.023	18.0	5.3	48.1	7.5	0.75					
	2	14.36	13.08	28.68	37.27	33.96	0.097	5.026	16.3	2.8	25.1	3.3	0.33	1.08	0.005	1.000	Soil Mass Translocated (kg)	= 26.5
	11			320.4	30.52	27.95	0.092	5.031	17.4	4.4	40.2			201.36	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extrated 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
1 9	1 1	21.96	19.81		34.53	31.15	0.109	5.010	64.9	74.6	678.7	134.4	13.44					
	2	22.97	20.67	40.48	33.31	29.98	0.111	5.020	146.2	158.3	1437.6	297.1	29.71	43.16	0.227	0.227	Bulk Density at to (kg/m3)	= 1579
	2 1	19.47	17.58		32.94	29.75	0.107	5.020	186.6	193.7	1758.5	309.1	30.91					
	2	18.71	16.86	34.44	30.70	27.68	0.109	5.020	122.0	136.2	1236.6	208.5	20.85	51.77	0.272	0.498	Background Cl (g/m2)	= 0
	3 1	20.40	18.44		31.56	28.54	0.106	5.020	85.7	98.9	898.0	165.6	16.56					
	2	19.27	17.44	35.89	35.22	31.89	0.104	5.020	127.0	141.1	1281.0	223.5	22.35	38.91	0.204	0.702	Cl Added to Plot (g)	= 237.5
	4 1	18.01	16.36		35.72	32.45	0.101	5.010	99.1	113.1	1029.1	168.3	16.83					
	2	18.69	16.97	33.32	30.44	27.64	0.101	5.010	54.7	62.7	570.4	96.8	9.68	26.51	0.139	0.842	Total Cl Measured at ti (g)	= 190.5
	5 1	8.47	7.67		36.39	32.98	0.103	5.020	66.2	76.1	690.8	53.0	5.30					
	2	13.38	12.06	19.73	31.92	28.78	0.109	5.010	34.1	33.0	300.5	36.2	3.62	8.92	0.047	0.888	Added Cl Recovered at ti (g)	= 190.5
	6 1	13.90	12.58		33.13	29.99	0.105	5.010	34.5	33.7	306.3	38.5	3.85					
	2	17.66	15.93	28.50	31.34	28.27	0.109	5.010	40.1	43.3	393.5	62.7	6.27	10.12	0.053	0.942	Cl Recovery Ratio	= 0.802
	7 1	10.28	9.33		33.06	30.01	0.102	5.010	24.3	18.3	166.7	15.6	1.56					
	2	17.90	16.18	25.50	32.40	29.29	0.106	5.010	28.3	24.4	222.0	35.9	3.59	5.15	0.027	0.969	Cl Translocated from Plot (g)	= 94.9
	8 1	14.95	13.37		36.14	32.34	0.118	5.010	21.3	11.1	100.7	13.5	1.35					
	2	16.31	14.71	28.08	30.10	27.15	0.109	5.020	22.9	14.7	133.1	19.6	1.96	3.30	0.017	0.986	Cl Not Translocated (g)	= 95.6
	9 1	15.22	13.67		32.71	29.39	0.113	5.010	17.8	4.1	37.6	5.1	0.51					
	2	18.00	16.10	29.78	32.37	28.97	0.117	5.010	19.6	7.3	66.8	10.8	1.08	1.59	0.008	0.994	Soil Volume Translocated (m3)	= 0.018
	10 1	16.01	14.33		31.43	28.14	0.117	5.010	18.0	4.5	40.9	5.9	0.59					
	2	16.48	14.79	29.12	32.30	28.99	0.114	5.010	17.6	3.8	34.7	5.1	0.51	1.10	0.006	1.000	Soil Mass Translocated (kg)	= 28.9
	11			304.8	33.67	30.33	0.110	5.010	14.9	0.1	0.9			190.53	1.000			
1 10	1 1	14.03	12.63		34.54	31.09	0.111	5.008	156.1	168.5	1533.7	193.7	19.37					
	2	14.75	13.34	25.97	33.89	30.67	0.105	5.017	48.7	55.8	506.9	67.6	6.76	26.13	0.185	0.185	Bulk Density at to (kg/m3)	= 1595
	2 1	14.12	12.74		34.15	30.82	0.108	5.019	88.3	101.7	924.0	117.7	11.77					
	2	16.44	14.85	27.59	36.35	32.84	0.107	5.010	211.8	217.7	1980.9	294.1	29.41	41.18	0.292	0.477	Background Cl (g/m2)	= 0
	3 1	17.10	15.39		32.44	29.20	0.111	5.007	75.9	87.4	795.7	122.4	12.24					
	2	13.88	12.60	27.99	33.34	30.29	0.101	5.030	139.4	153.0	1386.4	174.7	17.47	29.72	0.211	0.688	Cl Added to Plot (g)	= 237.5
	4 1	13.99	12.58		32.71	29.42	0.112	5.029	73.7	84.8	768.4	96.6	9.66					
	2	13.58	12.37	24.94	37.51	34.17	0.098	5.021	44.8	51.2	464.7	57.5	5.75	15.41	0.109	0.797	Total Cl Measured at ti (g)	= 141.1
	5 1	15.88	14.46		32.26	29.37	0.098	5.019	36.5	37.0	335.9	48.6	4.86					
	2	10.48	9.61	24.06	33.08	30.34	0.090	5.025	44.1	50.5	457.8	44.0	4.40	9.25	0.066	0.863	Added Cl Recovered at ti (g)	= 141.1
	6 1	15.13	13.73		34.20	31.04	0.102	5.015	32.4	30.4	276.3	37.9	3.79					
	2	12.29	11.29	25.01	35.12	32.26	0.089	5.019	30.7	27.9	252.9	28.5	2.85	6.65	0.047	0.910	Cl Recovery Ratio	= 0.594
	7 1	14.11	12.84		35.78	32.58	0.098	5.015	40.6	44.2	401.5	51.6	5.16					
	2	11.59	10.53	23.37	33.42	30.36	0.101	5.014	21.2	10.6	96.8	10.2	1.02	6.18	0.044	0.954	Cl Translocated from Plot (g)	= 67.3
	8 1	9.76	8.87		35.24	32.04	0.100	5.014	21.0	10.3	94.0	8.3	0.83					
	2	13.66	12.36	21.23	34.76	31.46	0.105	5.014	31.1	28.5	259.2	32.0	3.20	4.04	0.029	0.982	Cl Not Translocated (g)	= 73.8
	9 1	12.22	11.07		31.86	28.88	0.103	5.018	21.2	10.7	96.9	10.7	1.07					
	2	14.10	12.78	23.85	32.16	29.15	0.103	5.020	19.4	7.0	63.5	8.1	0.81	1.89	0.013	0.995	Soil Volume Translocated (m3)	= 0.021
	10 1	12.89	11.62		30.26	27.29	0.109	5.017	16.5	2.1	19.2	2.2	0.22					
	2	13.00	11.71	23.33	30.73	27.70	0.109	5.020	17.6	3.9	35.1	4.1	0.41	0.63	0.005	1.000	Soil Mass Translocated (kg)	= 33.3
	11			247.3	32.91	29.62	0.111	5.012	19.5	7.2	65.7			141.07	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
2 1 1 1	20.77	18.87		36.53	33.20	0.100	5.011	15.0	2.1	19.5	3.7	0.37					
2	12.73	11.45	30.32	34.83	31.34	0.111	5.011	14.2	0.0	0.0	0.0	0.00	0.37	0.003	0.003	Bulk Density at to (kg/m3)	= 1453
2 1	12.45	11.25		37.66	34.04	0.106	5.008	14.7	0.0	0.0	0.0	0.00					
2	16.10	14.45	25.70	37.29	33.48	0.114	5.019	13.8	0.0	0.0	0.0	0.00	0.00	0.000	0.003	Background Cl (g/m2)	= 0
3 1	15.02	13.57		36.26	32.78	0.106	5.011	13.9	0.0	0.0	0.0	0.00					
2	14.82	13.36	26.94	35.92	32.40	0.109	5.022	15.3	0.5	4.7	0.6	0.06	0.06	0.000	0.003	Cl Added to Plot (g)	= 237.5
4 1	10.56	9.48		37.03	33.27	0.113	5.020	13.8	0.0	0.0	0.0	0.00					
2	16.21	14.62	24.10	34.79	31.40	0.108	5.018	19.9	8.1	73.7	10.8	1.08	1.08	0.008	0.011	Total Cl Measured at ti (g)	= 132.4
5 1	13.64	12.28		33.39	30.07	0.110	5.005	58.5	67.1	611.3	75.1	7.51					
2	13.74	12.40	24.68	35.03	31.63	0.107	5.007	47.4	54.3	494.2	61.3	6.13	13.64	0.103	0.114	Added Cl Recovered at ti (g)	= 132.4
6 1	15.82	14.24		37.27	33.56	0.111	5.025	146.5	159.7	1448.3	206.3	20.63					
2	13.49	12.15	26.39	36.49	32.88	0.110	5.010	155.2	167.7	1525.6	185.4	18.54	39.16	0.296	0.410	Cl Recovery Ratio	= 0.558
7 1	11.19	10.08		37.37	33.68	0.109	5.015	123.4	137.6	1250.3	126.0	12.60					
2	14.95	13.38	23.46	34.79	31.15	0.117	5.012	152.1	164.9	1499.2	200.6	20.06	32.66	0.247	0.657	Cl Translocated from Plot (g)	= 0.4
8 1	15.01	13.45		35.99	32.27	0.115	5.007	145.8	159.0	1447.5	194.7	19.47					
2	15.22	13.65	27.10	37.73	33.86	0.114	5.009	48.7	55.8	507.6	69.3	6.93	26.40	0.199	0.856	Cl Not Translocated (g)	= 132.0
9 1	15.29	13.72		38.63	34.69	0.114	5.009	29.0	25.4	231.4	31.8	3.18					
2	18.37	16.49	30.21	35.88	32.21	0.114	5.020	53.8	61.6	559.6	92.3	9.23	12.40	0.094	0.950	Soil Volume Translocated (m3)	= 0.068
10 1	18.67	16.79		35.37	31.81	0.112	5.019	23.9	17.7	160.6	27.0	2.70					
2	17.63	15.85	32.64	37.89	34.08	0.112	5.018	30.4	27.4	249.0	39.5	3.95	6.64	0.050	1.000	Soil Mass Translocated (kg)	= 98.8
11			271.5	40.84	36.88	0.107	5.017	22.2	13.0	118.5			132.42	1.000			
2 2 1 1	22.40	20.12		33.25	29.88	0.113	5.018	45.0	51.4	467.1	94.0	9.40					
2	23.96	21.58	41.70	34.26	30.86	0.110	5.012	63.0	72.3	657.7	141.9	14.19	23.59	0.138	0.138	Bulk Density at to (kg/m3)	= 1516
2 1	18.38	16.50		35.39	31.77	0.114	5.016	133.6	147.5	1340.0	221.1	22.11					
2	18.78	16.84	33.34	35.40	31.75	0.115	5.009	180.0	189.7	1726.0	290.7	29.07	51.17	0.300	0.438	Background Cl (g/m2)	= 0
3 1	22.53	20.28		35.72	32.16	0.111	5.025	122.2	136.4	1237.1	250.9	25.09					
2	25.54	22.80	43.09	37.49	33.48	0.120	5.017	122.1	136.3	1238.2	282.4	28.24	53.33	0.313	0.751	Cl Added to Plot (g)	= 237.5
4 1	19.35	17.37		36.68	32.93	0.114	5.020	49.1	56.2	510.6	88.7	8.87					
2	16.40	14.93	32.30	33.08	30.13	0.098	5.024	67.3	77.3	701.4	104.7	10.47	19.34	0.113	0.864	Total Cl Measured at ti (g)	= 170.6
5 1	18.39	16.81		36.93	33.77	0.094	5.025	24.2	18.2	165.0	27.7	2.77					
2	19.35	17.39	34.19	37.20	33.43	0.113	5.034	29.5	26.1	236.1	41.1	4.11	6.88	0.040	0.905	Added Cl Recovered at ti (g)	= 170.6
6 1	15.00	13.51		38.16	34.39	0.110	5.023	21.5	11.3	102.9	13.9	1.39					
2	17.87	16.15	29.66	37.21	33.63	0.106	5.019	26.5	22.0	200.1	32.3	3.23	4.62	0.027	0.932	Cl Recovery Ratio	= 0.718
7 1	17.64	15.95		34.86	31.53	0.106	5.027	22.5	13.7	124.3	19.8	1.98					
2	11.26	10.07	26.02	36.26	32.45	0.117	5.013	26.0	21.3	194.1	19.6	1.96	3.94	0.023	0.955	Cl Translocated from Plot (g)	= 74.8
8 1	12.92	11.61		34.39	30.93	0.112	5.032	24.4	18.7	169.2	19.6	1.96					
2	14.05	12.59	24.20	35.71	32.00	0.116	5.022	21.6	11.6	105.3	13.3	1.33	3.29	0.019	0.974	Cl Not Translocated (g)	= 95.8
9 1	17.82	16.00		36.38	32.67	0.114	5.018	21.3	11.1	100.5	16.1	1.61					
2	12.13	10.85	26.85	39.83	35.65	0.117	5.034	19.7	7.7	69.5	7.5	0.75	2.36	0.014	0.988	Soil Volume Translocated (m3)	= 0.020
10 1	18.64	16.80		36.84	33.21	0.110	5.028	16.7	2.4	21.8	3.7	0.37					
2	9.76	8.76	25.55	31.49	28.27	0.114	5.031	26.0	21.4	193.8	17.0	1.70	2.06	0.012	1.000	Soil Mass Translocated (kg)	= 30.0
11			316.9	38.13	34.52	0.105	5.016	17.4	3.5	32.2			170.59	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
2 3	1 1 *	119.40	17.58		38.51	34.92	0.103	5.014	177.6	187.6	1705.4	299.9	29.99					
	2	19.62	17.82	35.41	34.93	31.74	0.101	5.022	110.0	124.2	1127.4	200.9	20.09	50.08	0.317	0.317	Bulk Density at to (kg/m3)	= 1615
	2 1	19.84	17.98		34.04	30.86	0.103	5.023	196.0	203.5	1846.4	332.0	33.20					
	2	19.08	17.29	35.27	37.08	33.62	0.103	5.019	150.4	163.3	1482.9	256.5	25.65	58.84	0.372	0.689	Background Cl (g/m2)	= 0
	3 1	16.37	14.85		37.18	33.74	0.102	5.020	88.1	101.6	922.1	136.9	13.69					
	2	19.75	17.91	32.76	37.30	33.83	0.102	5.026	63.9	73.4	665.8	119.2	11.92	25.62	0.162	0.851	Cl Added to Plot (g)	= 237.5
	4 1	18.82	17.11		37.76	34.35	0.100	5.021	24.7	19.3	175.3	30.0	3.00					
	2	16.09	14.60	31.71	34.42	31.23	0.102	5.017	41.2	45.3	411.2	60.0	6.00	9.00	0.057	0.908	Total Cl Measured at ti (g)	= 158.1
	5 1	17.85	16.19		33.77	30.64	0.102	5.024	30.2	27.1	246.2	39.9	3.99					
	2	12.25	11.09	27.28	37.65	34.11	0.104	5.017	19.2	6.7	60.5	6.7	0.67	4.66	0.029	0.937	Added Cl Recovered at ti (g)	= 158.1
	6 1	14.38	13.07		34.77	31.62	0.100	5.009	18.3	5.0	45.3	5.9	0.59					
	2	18.42	16.72	29.79	36.76	33.37	0.102	5.022	32.5	30.6	277.5	46.4	4.64	5.23	0.033	0.970	Cl Recovery Ratio	= 0.666
	7 1	13.87	12.63		36.04	32.84	0.098	5.017	25.1	20.2	183.8	23.2	2.32					
	2	18.44	16.70	29.33	34.34	31.10	0.104	5.017	15.2	0.4	3.8	0.6	0.06	2.38	0.015	0.986	Cl Translocated from Plot (g)	= 108.9
	8 1	17.73	16.12		36.44	33.15	0.099	5.013	15.6	0.9	8.5	1.4	0.14					
	2	18.83	17.09	33.21	34.69	31.49	0.101	5.015	20.7	9.6	87.2	14.9	1.49	1.63	0.010	0.996	Cl Not Translocated (g)	= 49.2
	9 1	20.03	18.18		34.54	31.36	0.101	5.014	14.2	0.0	0.0	0.0	0.00					
	2	15.92	14.47	32.65	33.98	30.90	0.100	5.026	17.2	3.2	29.4	4.3	0.43	0.43	0.003	0.999	Soil Volume Translocated (m3)	= 0.011
	10 1	11.28	10.29		36.36	33.19	0.096	5.016	16.7	2.5	22.8	2.4	0.24					
	2	16.70	15.16	25.45	35.64	32.36	0.101	5.019	13.6	0.0	0.0	0.0	0.00	0.24	0.001	1.000	Soil Mass Translocated (kg)	= 17.6
	11			312.9	35.43	32.31	0.097	5.014	16.4	2.0	18.1			158.10	1.000			
2 4	1 1 *	111.39	10.43		34.97	32.05	0.091	5.014	81.4	93.8	853.1	89.0	8.90					
	2	21.33	19.62	30.05	36.03	33.14	0.087	5.018	238.2	240.8	2187.6	429.2	42.92	51.82	0.318	0.318	Bulk Density at to (kg/m3)	= 1727
	2 1	13.57	12.50		38.80	35.77	0.085	5.016	211.4	217.4	1975.3	247.0	24.70					
	2	21.09	19.36	31.86	36.24	33.26	0.089	5.010	223.5	228.1	2075.1	401.6	40.16	64.86	0.398	0.716	Background Cl (g/m2)	= 0
	3 1	20.93	19.44		35.70	33.16	0.076	5.016	45.8	52.4	476.3	92.6	9.26					
	2	13.55	12.55	31.99	37.77	34.99	0.079	5.016	82.7	95.4	866.8	108.8	10.88	20.14	0.124	0.839	Cl Added to Plot (g)	= 237.5
	4 1	20.79	19.38		38.11	35.54	0.072	5.011	34.1	33.0	300.3	58.2	5.82					
	2	12.94	12.04	31.42	35.54	33.09	0.074	5.009	33.0	31.4	285.8	34.4	3.44	9.26	0.057	0.896	Total Cl Measured at ti (g)	= 163.0
	5 1	21.25	19.90		35.40	33.16	0.068	5.021	28.6	24.9	226.4	45.0	4.50					
	2	5.68	5.31	25.21	39.74	37.20	0.068	5.012	26.6	22.2	202.0	10.7	1.07	5.58	0.034	0.930	Added Cl Recovered at ti (g)	= 163.0
	6 1	20.76	19.45		36.97	34.65	0.067	5.017	24.0	17.6	160.2	31.2	3.12					
	2	4.68	4.39	23.84	36.67	34.46	0.064	5.019	23.8	17.0	154.1	6.8	0.68	3.79	0.023	0.954	Cl Recovery Ratio	= 0.686
	7 1	26.70	25.08		36.56	34.35	0.064	5.013	19.3	7.5	67.9	8.5	0.85					
	2			25.08	39.60	37.14	0.066	5.012	24.0	17.4	157.9	19.8	1.98	2.83	0.017	0.971	Cl Translocated from Plot (g)	= 116.7
	8 1	24.01	22.45		36.12	33.78	0.069	5.019	19.0	7.0	63.9	7.2	0.72					
	2			22.45	41.16	38.52	0.069	5.011	18.4	6.0	55.0	6.2	0.62	1.33	0.008	0.979	Cl Not Translocated (g)	= 46.3
	9 1	23.96	22.29		37.54	34.94	0.075	5.010	23.7	16.7	151.9	16.9	1.69					
	2			22.29	36.68	34.23	0.072	5.017	19.5	7.8	70.9	7.9	0.79	2.48	0.015	0.994	Soil Volume Translocated (m3)	= 0.011
	10 1	25.65	23.66		34.42	31.76	0.084	5.016	17.1	3.9	35.4	4.2	0.42					
	2			23.66	36.41	33.58	0.084	5.010	17.6	4.7	42.7	5.1	0.51	0.92	0.006	1.000	Soil Mass Translocated (kg)	= 19.7
	11			267.9	39.06	36.15	0.081	5.012	18.6	6.3	56.9			163.02	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
2 5	1 1	23.35	22.03		36.70	34.63	0.060	5.019	172.3	184.0	1671.1	368.1	36.81					
	2	19.73	18.65	40.68	35.89	33.93	0.058	5.022	163.0	175.4	1591.5	296.8	29.68	66.49	0.349	0.349	Bulk Density at to (kg/m3)	= 1784
	2 1	23.42	22.09		34.90	32.93	0.060	5.019	212.1	219.7	1995.4	440.9	44.09					
	2	21.36	20.16	42.25	36.87	34.80	0.059	5.010	152.8	165.7	1507.4	303.8	30.38	74.47	0.391	0.740	Background Cl (g/m2)	= 0
	3 1	21.81	20.80		39.23	37.42	0.048	5.019	76.0	86.7	787.0	163.7	16.37					
	2	18.55	17.75	38.55	38.33	36.68	0.045	5.024	40.5	43.9	398.6	70.7	7.07	23.44	0.123	0.863	Cl Added to Plot (g)	= 237.5
	4 1	24.66	23.78		41.54	40.07	0.037	5.018	24.2	17.9	162.2	38.6	3.86					
	2	21.36	20.58	44.36	41.04	39.55	0.037	5.007	21.4	11.6	105.5	21.7	2.17	6.03	0.032	0.894	Total Cl Measured at ti (g)	= 190.6
	5 1	21.09	20.24		39.35	37.78	0.042	5.009	26.2	21.4	195.0	39.5	3.95					
	2	24.72	23.82	44.06	44.03	42.44	0.038	5.013	17.0	3.8	34.8	8.3	0.83	4.78	0.025	0.919	Added Cl Recovered at ti (g)	= 190.6
	6 1	25.19	24.27		41.90	40.37	0.038	5.023	24.2	17.8	161.6	39.2	3.92					
	2	18.30	17.59	41.86	47.46	45.64	0.040	5.021	16.1	2.5	22.9	4.0	0.40	4.32	0.023	0.942	Cl Recovery Ratio	= 0.802
	7 1	24.26	23.34		43.12	41.49	0.039	5.005	17.4	4.4	39.6	9.2	0.92					
	2	26.54	25.43	48.77	41.31	39.59	0.043	5.025	19.9	8.6	77.7	19.8	1.98	2.90	0.015	0.957	Cl Translocated from Plot (g)	= 141.0
	8 1	18.67	17.88		41.33	39.60	0.044	5.018	15.7	2.1	19.3	3.5	0.35					
	2	25.55	24.23	42.11	39.25	37.23	0.054	5.004	24.4	18.4	167.6	40.6	4.06	4.41	0.023	0.980	Cl Not Translocated (g)	= 49.6
	9 1	22.43	21.39		43.47	41.47	0.048	5.007	18.5	6.1	55.3	11.8	1.18					
	2	26.16	24.80	46.19	38.43	36.44	0.055	5.019	17.3	4.3	39.1	9.7	0.97	2.15	0.011	0.992	Soil Volume Translocated (m3)	= 0.011
	10 1	25.63	24.26		39.25	37.16	0.056	5.011	16.9	3.7	33.8	8.2	0.82					
	2	24.16	22.77	47.03	42.95	40.48	0.061	5.013	16.9	3.7	33.9	7.7	0.77	1.59	0.008	1.000	Soil Mass Translocated (kg)	= 19.8
	11			435.9	40.35	37.42	0.078	5.009	17.0	3.9	35.2			190.58	1.000			
2 6	1 1	16.29	14.94		36.91	33.86	0.090	5.009	64.5	73.7	670.4	100.2	10.02					
	2	17.57	16.00	30.95	34.44	31.38	0.098	5.016	202.5	211.3	1920.0	307.3	30.73	40.74	0.302	0.302	Bulk Density at to (kg/m3)	= 1720
	2 1	17.63	16.06		36.56	33.32	0.097	5.009	127.0	140.5	1278.2	205.3	20.53					
	2	15.27	13.95	30.02	35.88	32.80	0.094	5.005	166.1	178.3	1623.3	226.5	22.65	43.18	0.320	0.622	Background Cl (g/m2)	= 0
	3 1	16.96	15.45		36.08	32.87	0.098	5.010	46.8	53.5	486.9	75.2	7.52					
	2	14.46	13.24	28.68	36.16	33.11	0.092	5.015	73.2	83.5	758.6	100.4	10.04	17.56	0.130	0.752	Cl Added to Plot (g)	= 237.5
	4 1	19.12	17.27		34.73	31.37	0.107	5.015	63.5	72.5	659.4	113.9	11.39					
	2	15.13	13.84	31.10	37.57	34.37	0.093	5.010	23.8	16.8	152.7	21.1	2.11	13.50	0.100	0.852	Total Cl Measured at ti (g)	= 135.0
	5 1	16.81	15.40		34.61	31.72	0.091	5.013	27.0	22.6	205.4	31.6	3.16					
	2	15.18	13.78	29.18	34.22	31.06	0.102	5.015	30.3	27.2	247.1	34.0	3.40	6.57	0.049	0.900	Added Cl Recovered at ti (g)	= 135.0
	6 1	17.21	15.66		34.76	31.65	0.098	5.010	23.2	15.5	141.1	22.1	2.21					
	2	13.47	12.29	27.96	36.07	32.93	0.095	5.010	19.8	8.4	76.1	9.4	0.94	3.15	0.023	0.924	Cl Recovery Ratio	= 0.569
	7 1	16.73	15.34		37.68	34.56	0.090	5.005	18.7	6.4	58.6	9.0	0.90					
	2	15.36	13.89	29.23	34.54	31.25	0.105	5.007	24.3	18.2	165.7	23.0	2.30	3.20	0.024	0.947	Cl Translocated from Plot (g)	= 83.9
	8 1	15.12	13.82		34.67	31.70	0.094	5.013	18.8	6.7	60.7	8.4	0.84					
	2	15.07	13.78	27.60	35.90	32.84	0.093	5.016	25.0	19.8	180.3	24.9	2.49	3.32	0.025	0.972	Cl Not Translocated (g)	= 51.1
	9 1	17.97	16.30		33.95	30.81	0.102	5.014	19.9	8.6	78.1	12.7	1.27					
	2	12.77	11.78	28.08	36.95	34.10	0.084	5.011	21.4	11.6	105.6	12.4	1.24	2.52	0.019	0.990	Soil Volume Translocated (m3)	= 0.016
	10 1	13.02	12.01		36.02	33.25	0.083	5.016	16.4	3.0	27.4	3.3	0.33					
	2	16.54	15.15	27.16	37.09	33.98	0.091	5.007	19.0	6.9	63.1	9.6	0.96	1.29	0.010	1.000	Soil Mass Translocated (kg)	= 27.2
	11			290.0	34.94	31.92	0.095	5.013	16.7	3.4	31.3			135.03	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
2 7 1c	1 *	c21.68	19.94		33.16	30.51	0.087	5.054	143.1	156.3	1409.9	281.2	28.12					
	2	16.62	15.34	35.28	32.52	30.02	0.083	5.065	85.7	97.6	878.4	134.7	13.47	41.59	0.228	0.228	Bulk Density at to (kg/m3)	= 1660
2c	1 *	c16.99	15.63		32.73	30.11	0.087	5.083	133.0	146.4	1313.1	205.2	20.52					
	2	16.76	15.45	31.07	34.25	31.58	0.085	5.085	197.8	207.1	1856.4	286.8	28.68	49.20	0.269	0.497	Background Cl (g/m2)	= 0
3	1	17.54	16.22		32.49	30.06	0.081	5.086	100.8	113.7	1019.0	165.3	16.53					
	2	14.41	13.24	29.47	31.04	28.54	0.088	5.072	95.1	107.7	968.1	128.2	12.82	29.35	0.161	0.658	Cl Added to Plot (g)	= 237.5
4	1	20.21	18.71		31.45	29.13	0.080	5.189	62.7	71.6	628.8	117.7	11.77					
	2	15.08	13.83	32.54	32.42	29.74	0.090	5.015	106.7	119.8	1089.1	150.6	15.06	26.83	0.147	0.805	Total Cl Measured at ti (g)	= 182.6
5	1	18.00	16.59		32.53	29.99	0.085	5.042	32.7	30.8	278.6	46.2	4.62					
	2	12.00	10.98	27.57	34.99	32.02	0.093	5.085	35.7	35.6	319.2	35.0	3.50	8.13	0.045	0.850	Added Cl Recovered at ti (g)	= 182.6
6	1	18.09	16.57		34.27	31.40	0.091	5.101	44.3	50.7	452.9	75.0	7.50					
	2	15.56	14.27	30.84	31.76	29.13	0.090	5.063	25.5	20.5	184.6	26.3	2.63	10.14	0.056	0.905	Cl Recovery Ratio	= 0.769
7	1	16.54	15.13		30.08	27.52	0.093	5.103	35.0	34.4	307.0	46.4	4.64					
	2	14.22	13.06	28.19	32.99	30.31	0.088	5.091	23.5	16.1	143.7	18.8	1.88	6.52	0.036	0.941	Cl Translocated from Plot (g)	= 90.8
8	1	14.40	13.16		34.42	31.47	0.094	5.138	21.0	10.6	94.1	12.4	1.24					
	2	16.57	15.15	28.31	32.71	29.91	0.094	5.071	33.5	32.0	287.2	43.5	4.35	5.59	0.031	0.971	Cl Not Translocated (g)	= 91.8
9	1	15.52	14.16		33.24	30.33	0.096	5.107	18.5	6.2	55.1	7.8	0.78					
	2	15.25	14.01	28.17	33.83	31.10	0.088	5.035	26.1	21.3	193.1	27.1	2.71	3.49	0.019	0.991	Soil Volume Translocated (m3)	= 0.021
10	1	13.93	12.74		31.68	28.99	0.093	5.131	20.5	9.7	86.4	11.0	1.10					
	2	16.54	15.18	27.93	35.37	32.48	0.089	5.069	17.5	4.6	41.6	6.3	0.63	1.73	0.009	1.000	Soil Mass Translocated (kg)	= 34.1
11				299.4	30.69	28.27	0.086	5.138	26.7	22.1	196.1			182.56	1.000			
2 8	1 1	17.23	15.64		37.12	33.69	0.102	5.015	71.7	81.8	743.5	116.3	11.63					
	2	17.59	15.91	31.55	35.12	31.78	0.105	5.008	73.4	83.7	761.9	121.2	12.12	23.75	0.148	0.148	Bulk Density at to (kg/m3)	= 1617
	2 1	20.26	18.35		34.64	31.39	0.104	5.012	164.9	177.1	1610.9	295.7	29.57					
	2	19.78	17.87	36.23	35.80	32.36	0.106	5.015	150.8	163.8	1488.5	266.1	26.61	56.17	0.350	0.498	Background Cl (g/m2)	= 0
	3 1	13.55	12.26		36.80	33.30	0.105	5.012	111.4	124.7	1133.8	139.0	13.90					
	2	20.05	18.04	30.30	38.43	34.58	0.111	5.012	93.2	105.7	961.0	173.3	17.33	31.23	0.195	0.693	Cl Added to Plot (g)	= 237.5
	4 1	13.95	12.64		38.38	34.79	0.103	5.013	139.1	152.4	1386.0	175.2	17.52					
	2	14.54	13.13	25.77	36.49	32.96	0.107	5.014	52.8	60.4	548.9	72.1	7.21	24.73	0.154	0.847	Total Cl Measured at ti (g)	= 160.4
	5 1	11.94	10.81		36.54	33.10	0.104	5.015	34.0	32.8	298.5	32.3	3.23					
	2	14.73	13.34	24.16	39.22	35.54	0.104	5.017	43.1	48.8	443.0	59.1	5.91	9.14	0.057	0.904	Added Cl Recovered at ti (g)	= 160.4
	6 1	17.00	15.40		34.67	31.42	0.104	5.016	27.1	23.0	208.9	32.2	3.22					
	2	13.21	12.00	27.40	35.08	31.87	0.101	5.018	23.9	18.0	163.9	19.7	1.97	5.18	0.032	0.936	Cl Recovery Ratio	= 0.675
	7 1	12.51	11.37		33.20	30.18	0.100	5.018	27.2	23.1	210.2	23.9	2.39					
	2	18.60	16.24	27.60	34.57	30.18	0.145	5.019	23.6	17.2	155.8	25.3	2.53	4.92	0.031	0.967	Cl Translocated from Plot (g)	= 79.9
	8 1	10.48	9.49		32.88	29.78	0.104	5.010	20.7	10.4	94.2	8.9	0.89					
	2	16.37	14.82	24.31	34.55	31.29	0.104	5.008	21.1	11.3	103.2	15.3	1.53	2.42	0.015	0.982	Cl Not Translocated (g)	= 80.5
	9 1	15.07	13.65		36.12	32.72	0.104	5.017	15.1	1.1	9.6	1.3	0.13					
	2	16.02	14.51	28.16	34.65	31.40	0.104	5.008	22.2	13.9	126.7	18.4	1.84	1.97	0.012	0.995	Soil Volume Translocated (m3)	= 0.018
	10 1	9.79	8.84		36.29	32.80	0.107	5.018	19.8	8.7	78.7	7.0	0.70					
	2	17.52	15.90	24.74	34.73	31.52	0.102	5.008	15.3	1.2	11.3	1.8	0.18	0.88	0.005	1.000	Soil Mass Translocated (kg)	= 29.7
11				280.2	37.64	34.08	0.104	5.006	20.0	9.1	82.8			160.39	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
2 9	1 1	20.54	18.67		36.00	32.72	0.100	5.025	72.7	81.3	737.5	137.7	13.77					
	2	19.96	18.12	36.78	39.24	35.63	0.101	5.031	110.7	122.3	1108.2	200.8	20.08	33.84	0.177	0.177	Bulk Density at to (kg/m3)	= 1579
	2 1	20.41	18.50		37.93	34.40	0.103	5.020	159.2	169.1	1535.3	284.1	28.41					
	2	19.57	17.72	36.23	38.36	34.74	0.104	5.031	182.0	189.6	1718.1	304.5	30.45	58.86	0.307	0.484	Background Cl (g/m2)	= 0
	3 1	16.74	15.12		35.92	32.46	0.107	5.027	102.3	113.8	1031.8	156.0	15.60					
	2	18.52	16.73	31.86	37.26	33.67	0.106	5.033	158.7	168.6	1527.2	255.6	25.56	41.16	0.215	0.698	Cl Added to Plot (g)	= 237.5
	4 1	20.43	18.35		34.56	31.04	0.113	5.027	38.7	39.3	356.4	65.4	6.54					
	2	17.56	15.83	34.18	33.11	29.86	0.109	5.021	78.5	88.0	798.6	126.4	12.64	19.18	0.100	0.799	Total Cl Measured at ti (g)	= 191.7
	5 1	17.12	15.41		36.60	32.97	0.110	5.021	29.1	25.5	231.3	35.7	3.57					
	2	19.95	17.94	33.35	34.21	30.76	0.112	5.022	66.0	73.7	668.5	119.9	11.99	15.56	0.081	0.880	Added Cl Recovered at ti (g)	= 191.7
	6 1	13.49	12.11		36.27	32.57	0.114	5.016	35.4	34.2	310.7	37.6	3.76					
	2	19.70	17.83	29.94	37.31	33.77	0.105	5.028	33.5	31.5	285.6	50.9	5.09	8.85	0.046	0.926	Cl Recovery Ratio	= 0.807
	7 1	17.56	15.81		34.05	30.67	0.110	5.025	17.8	5.0	45.5	7.2	0.72					
	2	17.79	15.96	31.77	35.78	32.10	0.114	5.029	26.6	22.4	202.6	32.3	3.23	3.95	0.021	0.947	Cl Translocated from Plot (g)	= 92.7
	8 1	18.10	16.32		32.07	28.92	0.109	5.012	32.8	30.5	277.3	45.2	4.52					
	2	17.42	15.61	31.92	33.84	30.33	0.116	5.009	16.7	3.2	28.8	4.5	0.45	4.97	0.026	0.972	Cl Not Translocated (g)	= 99.0
	9 1	18.59	16.67		32.50	29.15	0.115	5.027	26.7	22.5	204.4	34.1	3.41					
	2	12.52	11.27	27.94	31.05	27.98	0.110	5.036	18.3*	5.8	52.9	6.0	0.60	4.00	0.021	0.993	Soil Volume Translocated (m3)	= 0.020
	10 1	12.49	11.21		35.18	31.58	0.114	5.029	20.6	10.2	92.3	10.3	1.03					
	2	18.97	17.03	28.24	30.61	27.49	0.113	5.023	15.5	1.5	13.8	2.3	0.23	1.27	0.007	1.000	Soil Mass Translocated (kg)	= 32.3
	11			322.2	33.51	30.07	0.115	5.010	19.3	7.6	69.3			191.65	1.000			
2 10	1 1	16.47	15.25		37.63	34.85	0.080	5.030	113.1	124.7	1130.3	172.4	17.24					
	2	19.00	17.59	32.84	37.85	35.05	0.080	5.026	107.8	119.4	1082.8	190.5	19.05	36.28	0.227	0.227	Bulk Density at to (kg/m3)	= 1595
	2 1	16.95	15.59		37.99	34.96	0.087	5.024	189.4	196.1	1779.2	277.4	27.74					
	2	17.59	16.21	31.80	37.19	34.28	0.085	5.023	178.4	186.5	1692.0	274.3	27.43	55.17	0.346	0.573	Background Cl (g/m2)	= 0
	3 1	17.19	15.81		36.46	33.55	0.087	5.036	125.1	136.6	1236.7	195.6	19.56					
	2	17.85	16.40	32.21	36.20	33.26	0.088	5.021	119.2	130.8	1187.6	194.7	19.47	39.03	0.245	0.818	Cl Added to Plot (g)	= 237.5
	4 1	19.35	17.80		35.68	32.83	0.087	5.018	29.6	26.2	237.6	42.3	4.23					
	2	17.88	16.46	34.26	33.99	31.30	0.086	5.025	35.0	33.7	305.3	50.2	5.02	9.25	0.058	0.876	Total Cl Measured at ti (g)	= 159.5
	5 1	19.04	17.43		38.44	35.19	0.092	5.024	29.8	26.5	240.3	41.9	4.19					
	2	19.95	18.36	35.78	34.64	31.89	0.086	5.012	23.4	16.8	153.0	28.1	2.81	7.00	0.044	0.920	Added Cl Recovered at ti (g)	= 159.5
	6 1	17.51	16.08		34.80	31.97	0.089	5.020	23.0	15.7	142.2	22.9	2.29					
	2	18.56	17.06	33.14	35.75	32.86	0.088	5.021	21.6	12.5	113.5	19.4	1.94	4.22	0.026	0.946	Cl Recovery Ratio	= 0.672
	7 1	19.72	17.94		36.51	33.23	0.099	5.024	25.1	20.6	186.9	33.5	3.35					
	2	20.15	18.46	36.40	33.84	31.01	0.091	5.027	17.6	4.6	41.7	7.7	0.77	4.12	0.026	0.972	Cl Translocated from Plot (g)	= 91.5
	8 1	19.43	17.60		37.38	33.86	0.104	5.028	16.2	2.5	22.6	4.0	0.40					
	2	14.01	12.86	30.46	35.36	32.48	0.089	5.026	23.4	16.7	151.2	19.4	1.94	2.34	0.015	0.987	Cl Not Translocated (g)	= 68.0
	9 1	21.49	19.60		34.46	31.43	0.096	5.012	14.9	0.8	7.2	1.4	0.14					
	2	18.12	16.33	35.92	34.20	30.83	0.109	5.019	21.0	11.1	100.6	16.4	1.64	1.79	0.011	0.998	Soil Volume Translocated (m3)	= 0.015
	10 1	18.74	16.91		35.69	32.21	0.108	5.021	13.7	0.0	0.0	0.0	0.00					
	2	17.02	15.47	32.38	37.95	34.51	0.100	5.017	15.9	2.1	18.9	2.9	0.29	0.29	0.002	1.000	Soil Mass Translocated (kg)	= 24.6
	11			335.2	31.47	28.44	0.107	5.030	15.1	1.0	8.8			159.50	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 02 91; analysed 03 91)

Treatment Plot Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	------Laboratory Measurements------ Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot
2 7 1				33.08	30.57	0.082	5.063	104.4	117.5							
1 1				33.63	30.96	0.086	5.074	104.2	117.2							
2				34.31	31.58	0.086	5.037	72.5	77.0							

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 03 91; analysed 03 91)

Treatment	Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3	1	1 1	25.56	22.60		35.29	31.21	0.131	5.011	14.0	2.1	19.1	4.3	0.43					
		2	15.36	13.50	36.10	36.65	32.23	0.137	5.012	109.3	122.0	1109.2	149.8	14.98	15.41	0.095	0.095	Bulk Density at to (kg/m3)	= 1453
		2 1	23.69	20.86		32.08	28.25	0.136	5.010	140.4	151.7	1380.5	287.9	28.79					
		2	18.00	15.87	36.73	35.07	30.93	0.134	5.018	112.2	124.8	1133.9	179.9	17.99	46.79	0.289	0.385	Background Cl (g/m2)	= 0
		3 1	15.68	13.92		33.18	29.46	0.126	5.020	122.5	134.9	1224.6	170.4	17.04					
		2	17.61	15.61	29.53	32.82	29.10	0.128	5.015	149.1	159.7	1451.2	226.5	22.65	39.69	0.246	0.630	Cl Added to Plot (g)	= 237.5
		4 1	20.93	18.50		31.13	27.53	0.131	5.013	169.7	177.8	1616.5	299.1	29.91					
		2	7.19	6.36	24.87	33.77	29.90	0.129	5.019	127.8	139.9	1270.8	80.9	8.09	38.00	0.235	0.866	Total Cl Measured at ti (g)	= 161.6
		5 1	12.87	11.40		33.57	29.74	0.129	5.013	39.4	41.5	377.3	43.0	4.30					
		2	13.86	12.21	23.61	31.33	27.62	0.134	5.014	57.0	64.5	586.0	71.6	7.16	11.46	0.071	0.936	Added Cl Recovered at ti (g)	= 161.6
		6 1	18.56	16.48		31.19	27.70	0.126	5.011	27.4	23.7	216.0	35.6	3.56					
		2	8.92	7.86	24.34	32.05	28.26	0.134	5.008	23.6	18.2	165.7	13.0	1.30	4.86	0.030	0.966	Cl Recovery Ratio	= 0.681
		7 1	21.01	18.54		32.29	28.51	0.133	5.010	22.0	14.7	133.8	24.8	2.48					
		2	5.81	5.12	23.66	32.49	28.64	0.135	5.015	15.9	4.4	39.9	2.0	0.20	2.69	0.017	0.983	Cl Translocated from Plot (g)	= 99.4
		8 1	14.29	12.58		32.46	28.59	0.135	5.020	19.4	9.7	88.1	11.1	1.11					
		2	18.53	16.33	28.91	32.37	28.53	0.135	5.018	15.5	3.9	35.1	5.7	0.57	1.68	0.010	0.994	Cl Not Translocated (g)	= 62.2
		9 1	16.68	14.71		37.11	32.74	0.134	5.016	14.4	2.5	23.1	3.4	0.34					
		2	10.72	9.43	24.13	32.76	28.81	0.137	5.015	15.7	4.1	37.2	3.5	0.35	0.69	0.004	0.998	Soil Volume Translocated (m3)	= 0.020
		10 1	13.12	11.57		34.71	30.62	0.134	5.015	13.3	1.4	12.6	1.5	0.15					
		2	16.74	14.72	26.28	32.34	28.44	0.137	5.013	13.5	1.6	14.4	2.1	0.21	0.36	0.002	1.000	Soil Mass Translocated (kg)	= 28.7
		11			278.1	35.13	30.96	0.135	5.014	12.4	0.7	5.9			161.62	1.000			
3	2	1 1	16.35	14.50		36.37	32.27	0.127	5.015	36.7	37.1	337.2	48.9	4.89					
		2	17.00	15.07	29.57	37.29	33.06	0.128	5.019	31.8	29.7	270.1	40.7	4.07	8.96	0.082	0.082	Bulk Density at to (kg/m3)	= 1516
		2 1	13.94	12.33		32.41	28.67	0.131	5.013	71.0	80.6	732.7	90.3	9.03					
		2	15.31	13.56	25.88	36.09	31.97	0.129	5.010	113.5	126.1	1147.3	155.5	15.55	24.58	0.224	0.306	Background Cl (g/m2)	= 0
		3 1	15.30	13.53		38.23	33.80	0.131	5.018	107.3	120.0	1089.8	147.4	14.74					
		2	14.89	13.20	26.72	32.06	28.43	0.128	5.019	183.1	189.1	1716.9	226.6	22.66	37.40	0.341	0.647	Cl Added to Plot (g)	= 237.5
		4 1	14.29	12.67		36.02	31.94	0.128	5.009	89.2	101.6	924.2	117.1	11.71					
		2	13.85	12.28	24.95	33.46	29.68	0.127	5.013	90.8	103.2	938.0	115.2	11.52	23.23	0.212	0.859	Total Cl Measured at ti (g)	= 109.6
		5 1	13.92	12.34		34.54	30.63	0.128	5.018	36.1	36.2	328.8	40.6	4.06					
		2	15.25	13.55	25.89	33.04	29.37	0.125	5.011	29.3	26.3	239.1	32.4	3.24	7.30	0.067	0.926	Added Cl Recovered at ti (g)	= 109.6
		6 1	15.25	13.51		36.36	32.22	0.128	5.009	27.8	24.2	220.0	29.7	2.97					
		2	14.81	13.15	26.66	35.07	31.15	0.126	5.016	20.4	11.4	103.8	13.6	1.36	4.34	0.040	0.965	Cl Recovery Ratio	= 0.462
		7 1	15.12	13.42		36.16	32.11	0.126	5.016	15.6	4.0	35.9	4.8	0.48					
		2	15.04	13.32	26.75	36.07	31.96	0.129	5.012	20.1	10.8	98.5	13.1	1.31	1.79	0.016	0.982	Cl Translocated from Plot (g)	= 33.5
		8 1	15.78	14.02		31.93	28.37	0.125	5.008	16.7	5.5	50.0	7.0	0.70					
		2	14.07	12.49	26.50	35.62	31.62	0.126	5.019	14.2	2.3	21.3	2.7	0.27	0.97	0.009	0.990	Cl Not Translocated (g)	= 76.1
		9 1	16.52	14.66		35.43	31.46	0.126	5.017	13.5	1.7	15.0	2.2	0.22					
		2	12.92	11.48	26.14	35.41	31.46	0.125	5.019	14.3	2.5	22.5	2.6	0.26	0.48	0.004	0.995	Soil Volume Translocated (m3)	= 0.022
		10 1	15.01	13.34		33.34	29.65	0.124	5.014	13.7	1.8	16.2	2.2	0.22					
		2	16.58	14.74	28.09	35.03	31.15	0.124	5.020	14.4	2.6	23.7	3.5	0.35	0.57	0.005	1.000	Soil Mass Translocated (kg)	= 33.3
		11			267.1	35.14	31.26	0.124	5.014	13.4	1.5	13.9			109.61	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 03 91; analysed 03 91)

Treatment	Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3	4	1 1	23.31	21.17		35.35	32.10	0.101	5.008	33.4	32.0	291.4	61.7	6.17					
		2	22.60	20.55	41.72	36.03	32.78	0.099	5.016	74.3	84.4	766.7	157.6	15.76	21.93	0.121	0.121	Bulk Density at to (kg/m3)	= 1727
		2 1	21.49	19.57		35.75	32.56	0.098	5.005	79.5	90.4	823.5	161.1	16.11					
		2	17.87	16.21	35.78	36.89	33.48	0.102	5.004	100.5	113.1	1030.6	167.1	16.71	32.82	0.181	0.302	Background Cl (g/m2)	= 0
		3 1	21.16	19.44		35.15	32.30	0.088	5.011	90.9	103.3	939.8	182.7	18.27					
		2	16.73	15.25	34.69	34.77	31.71	0.097	5.012	113.4	126.0	1146.0	174.8	17.48	35.75	0.197	0.499	Cl Added to Plot (g)	= 237.5
		4 1	23.31	21.30		34.35	31.38	0.094	5.008	90.9	103.4	940.7	200.3	20.03					
		2	17.84	16.38	37.67	33.75	30.99	0.089	5.010	98.0	110.6	1006.4	164.8	16.48	36.52	0.201	0.701	Total Cl Measured at ti (g)	= 181.2
		5 1	17.82	16.22		35.43	32.25	0.099	5.020	50.7	57.3	520.0	84.3	8.43					
		2	22.79	20.89	37.10	33.25	30.48	0.091	5.012	88.1	100.4	913.0	190.7	19.07	27.50	0.152	0.853	Added Cl Recovered at ti (g)	= 181.2
		6 1	15.25	13.88		36.44	33.18	0.098	5.006	32.6	30.9	281.3	39.0	3.90					
		2	24.19	22.08	35.96	33.79	30.85	0.095	5.016	64.6	73.2	665.5	147.0	14.70	18.60	0.103	0.955	Cl Recovery Ratio	= 0.763
		7 1	18.30	16.67		33.70	30.71	0.097	5.013	25.5	21.3	193.9	16.2	3.23					
		2	17.95	16.37	33.04	32.78	29.91	0.096	5.005	21.3	13.2	119.9	10.0	1.96	5.20	0.029	0.984	Cl Translocated from Plot (g)	= 54.8
		8 1	18.93	17.30		37.12	33.93	0.094	5.013	15.9	4.4	39.8	3.4	0.69					
		2	19.20	17.44	34.74	34.91	31.71	0.101	5.017	16.1	4.6	42.0	3.6	0.73	1.42	0.008	0.992	Cl Not Translocated (g)	= 126.5
		9 1	16.41	15.05		37.25	34.17	0.090	5.016	16.4	5.0	45.1	3.4	0.68					
		2	18.47	16.82	31.87	35.70	32.51	0.098	5.011	14.1	2.2	20.1	1.5	0.34	1.02	0.006	0.997	Soil Volume Translocated (m3)	= 0.026
		10 1	17.68	16.16		34.94	31.94	0.094	5.018	13.5	1.6	14.9	1.2	0.24					
		2	18.93	17.24	33.40	33.12	30.17	0.098	5.013	13.4	1.5	14.0	1.1	0.24	0.48	0.003	1.000	Soil Mass Translocated (kg)	= 45.3
		11			356.0	35.69	32.63	0.094	5.015	13.2	1.3	11.8			181.23	1.000			
3	5	1 1	22.25	20.07		35.43	31.97	0.108	5.009	20.1	11.0	99.7	20.0	2.00					
		2	18.10	16.35	36.41	37.65	34.01	0.107	5.015	21.3	13.1	119.5	19.5	1.95	3.95	0.022	0.022	Bulk Density at to (kg/m3)	= 1784
		2 1	19.03	17.21		36.30	32.83	0.106	5.012	95.6	108.1	983.1	169.2	16.92					
		2	20.10	18.26	35.47	39.67	36.04	0.101	5.008	20.8	12.2	110.8	20.2	2.02	18.94	0.105	0.127	Background Cl (g/m2)	= 0
		3 1	24.04	21.86		34.37	31.26	0.099	5.012	38.8	40.5	368.7	80.6	8.06					
		2	23.87	21.47	43.33	34.99	31.47	0.112	5.004	167.7	176.1	1603.8	344.3	34.43	42.49	0.235	0.361	Cl Added to Plot (g)	= 237.5
		4 1	23.84	21.59		34.82	31.54	0.104	5.018	97.2	109.8	997.5	215.4	21.54					
		2	20.15	18.25	39.84	32.36	29.32	0.104	5.016	158.3	167.9	1525.5	278.4	27.84	49.38	0.273	0.634	Total Cl Measured at ti (g)	= 181.0
		5 1	18.92	17.15		33.95	30.78	0.103	5.020	82.9	94.0	853.9	146.4	14.64					
		2	20.74	18.73	35.88	29.70	26.82	0.107	5.019	92.7	104.8	952.1	178.3	17.83	32.47	0.179	0.814	Added Cl Recovered at ti (g)	= 181.0
		6 1	20.25	18.30		34.60	31.29	0.106	5.011	46.7	52.7	479.3	87.7	8.77					
		2	21.03	19.04	37.35	39.23	35.54	0.104	5.012	59.7	67.7	615.2	117.2	11.72	20.49	0.113	0.927	Cl Recovery Ratio	= 0.762
		7 1	22.32	20.32		37.20	33.88	0.098	5.009	30.3	27.6	251.4	51.1	5.11					
		2	22.02	19.83	40.15	33.90	30.53	0.110	5.014	25.9	21.8	198.5	39.4	3.94	9.04	0.050	0.977	Cl Translocated from Plot (g)	= 22.9
		8 1	22.39	20.46		34.75	31.77	0.094	5.010	19.3	9.4	85.9	17.6	1.76					
		2	21.15	19.11	39.58	33.99	30.73	0.106	5.010	15.8	4.3	39.0	7.4	0.74	2.50	0.014	0.991	Cl Not Translocated (g)	= 158.1
		9 1	19.41	17.58		36.70	33.25	0.104	5.022	14.7	2.9	26.3	4.6	0.46					
		2	18.03	16.42	34.00	37.04	33.75	0.098	5.018	14.9	3.1	28.1	4.6	0.46	0.92	0.005	0.996	Soil Volume Translocated (m3)	= 0.033
		10 1	21.63	19.57		34.35	31.09	0.105	5.010	14.1	2.3	20.5	4.0	0.40					
		2	19.54	17.71	37.28	33.05	29.96	0.103	5.015	14.3	2.4	21.9	3.9	0.39	0.79	0.004	1.000	Soil Mass Translocated (kg)	= 59.0
		11			379.3	40.00	36.25	0.103	5.019	12.0	0.3	2.5			180.98	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3 6	1 1	22.58	20.71		33.54	30.77	0.090	5.007	28.3	25.1	228.7	47.4	4.74					
	2	29.95	27.20	47.91	33.58	30.50	0.101	5.016	20.5	10.8	97.7	26.6	2.66	7.39	0.041	0.041	Bulk Density at to (kg/m3)	= 1720
	2 1	26.85	24.43		34.80	31.67	0.099	5.016	58.8	66.3	602.8	147.3	14.73					
	2	21.22	19.34	43.78	31.23	28.47	0.097	5.017	45.2	50.8	461.9	89.3	8.93	23.66	0.131	0.172	Background Cl (g/m2)	= 0
	3 1	25.14	22.78		31.14	28.22	0.104	5.017	89.0	100.9	916.8	208.8	20.88					
	2	23.86	21.67	44.45	35.47	32.22	0.101	5.016	139.3	152.6	1387.1	300.6	30.06	50.94	0.281	0.453	Cl Added to Plot (g)	= 237.5
	4 1	21.11	19.16		31.51	28.61	0.102	5.017	77.0	87.2	792.0	151.7	15.17					
	2	25.33	23.08	42.24	32.08	29.24	0.097	5.015	88.2	100.1	910.2	210.1	21.01	36.18	0.200	0.653	Total Cl Measured at ti (g)	= 181.1
	5 1	29.29	26.93		33.26	30.59	0.087	5.009	63.1	71.2	648.0	174.5	17.45					
	2	24.78	22.52	49.45	32.78	29.80	0.100	5.019	54.4	61.3	556.6	125.4	12.54	29.99	0.166	0.818	Added Cl Recovered at ti (g)	= 181.1
	6 1	26.01	23.64		41.93	38.12	0.100	5.017	34.0	33.0	299.9	70.9	7.09					
	2	27.61	25.31	48.94	37.15	34.05	0.091	5.014	40.3	42.9	390.3	98.8	9.88	16.97	0.094	0.912	Cl Recovery Ratio	= 0.762
	7 1	30.45	27.98		38.30	35.21	0.088	5.009	29.4	26.5	241.4	67.5	6.75					
	2	25.82	23.71	51.70	36.42	33.46	0.089	5.011	23.5	18.0	164.0	38.9	3.89	10.64	0.059	0.971	Cl Translocated from Plot (g)	= 31.1
	8 1	26.49	24.29		36.14	33.15	0.090	5.015	18.7	7.1	64.4	15.6	1.56					
	2	25.65	23.39	47.69	36.11	32.93	0.096	5.007	17.5	4.9	44.4	10.4	1.04	2.60	0.014	0.985	Cl Not Translocated (g)	= 150.0
	9 1	25.11	22.76		38.03	34.47	0.103	5.020	16.0	2.5	23.0	5.2	0.52					
	2	24.94	22.87	45.62	39.52	36.25	0.090	5.007	16.8	3.8	34.6	7.9	0.79	1.32	0.007	0.992	Soil Volume Translocated (m3)	= 0.032
	10 1	28.36	25.89		39.31	35.89	0.095	5.013	16.6	3.4	30.9	8.0	0.80					
	2	26.10	23.69	49.58	37.08	33.67	0.101	5.019	16.1	2.7	24.7	5.9	0.59	1.39	0.008	1.000	Soil Mass Translocated (kg)	= 55.0
	11			471.4	35.66	32.41	0.100	5.017	15.2	1.4	12.4			181.08	1.000			
3 7	1 1	16.99	15.42		33.84	30.73	0.101	5.002	20.3	10.4	95.0	14.6	1.46					
	2	17.07	15.56	30.98	30.93	28.20	0.097	5.010	32.0	30.2	274.8	42.8	4.28	5.74	0.037	0.037	Bulk Density at to (kg/m3)	= 1660
	2 1	18.49	16.86		35.24	32.14	0.097	5.014	42.8	0.0	0.0	0.0	0.00					
	2	19.48	17.67	34.53	35.59	32.29	0.102	5.001	80.1	90.8	827.7	146.2	14.62	14.62	0.093	0.130	Background Cl (g/m2)	= 0
	3 1	21.91	19.88		35.42	32.15	0.102	5.004	116.5	129.7	1181.4	234.9	23.49					
	2	22.30	20.26	40.14	37.64	34.21	0.100	5.013	90.9	102.9	935.9	189.6	18.96	42.45	0.270	0.400	Cl Added to Plot (g)	= 237.5
	4 1	19.30	17.61		37.06	33.83	0.096	5.005	120.9	134.2	1222.1	215.2	21.52					
	2	19.64	17.88	35.49	34.76	31.65	0.098	5.007	129.3	142.7	1298.9	232.2	23.22	44.74	0.285	0.685	Total Cl Measured at ti (g)	= 157.1
	5 1	19.76	18.09		33.68	30.84	0.092	5.006	82.7	93.7	853.6	154.4	15.44					
	2	19.78	18.10	36.19	34.51	31.59	0.093	5.005	74.4	84.3	767.3	138.9	13.89	29.33	0.187	0.871	Added Cl Recovered at ti (g)	= 157.1
	6 1	23.18	21.45		34.63	32.05	0.081	5.001	28.7	25.7	233.9	50.2	5.02					
	2	21.27	19.63	41.07	34.24	31.60	0.084	5.005	40.8	43.8	398.9	78.3	7.83	12.84	0.082	0.953	Cl Recovery Ratio	= 0.662
	7 1	23.42	21.50		36.19	33.22	0.089	5.006	19.3	8.2	74.4	16.0	1.60					
	2	17.53	16.16	37.66	36.87	34.00	0.084	5.004	23.0	16.8	152.6	24.7	2.47	4.07	0.026	0.979	Cl Translocated from Plot (g)	= 20.4
	8 1	21.30	19.52		37.02	33.94	0.091	5.005	16.9	4.0	36.3	7.1	0.71					
	2	23.42	21.62	41.15	32.46	29.97	0.083	5.014	17.8	5.5	50.0	10.8	1.08	1.79	0.011	0.990	Cl Not Translocated (g)	= 136.8
	9 1	24.00	21.91		36.65	33.46	0.095	5.017	16.9	4.0	36.0	7.9	0.79					
	2	19.61	18.14	40.04	35.05	32.42	0.081	5.010	15.6	2.0	18.3	3.3	0.33	1.12	0.007	0.997	Soil Volume Translocated (m3)	= 0.031
	10 1	22.32	20.43		40.73	37.29	0.092	5.007	14.6	0.6	5.7	1.2	0.12					
	2	17.66	16.19	36.61	34.90	32.00	0.091	5.017	15.6	2.0	18.1	2.9	0.29	0.41	0.003	1.000	Soil Mass Translocated (kg)	= 51.6
	11			373.9	37.51	34.25	0.095	5.006	15.6	1.9	17.5			157.12	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3 10 1	1	23.56	21.31		35.93	32.50	0.106	5.018	59.9	67.8	615.8	131.2	13.12					
	2	21.43	19.38	40.69	33.45	30.26	0.106	5.015	23.5	18.0	163.4	31.7	3.17	16.29	0.093	0.093	Bulk Density at to (kg/m3)	= 1595
2	1	22.77	20.67		32.59	29.59	0.101	5.013	93.3	105.8	961.9	198.8	19.88					
	2	25.44	23.16	43.83	35.41	32.24	0.098	5.012	115.4	128.0	1163.8	269.5	26.95	46.84	0.267	0.360	Background Cl (g/m2)	= 0
3	1	24.06	21.92		30.95	28.19	0.098	5.015	125.3	137.6	1250.2	274.0	27.40					
	2	18.00	16.38	38.30	32.65	29.73	0.098	5.005	115.9	128.5	1169.9	191.7	19.17	46.56	0.266	0.625	Cl Added to Plot (g)	= 237.5
4	1	17.79	16.32		32.69	29.99	0.090	5.006	133.0	144.9	1318.9	215.2	21.52					
	2	18.36	16.67	32.99	32.37	29.41	0.101	5.016	116.6	129.1	1173.6	195.7	19.57	41.09	0.234	0.860	Total Cl Measured at ti (g)	= 175.4
5	1	12.43	11.31		34.02	30.97	0.099	5.019	73.4	83.4	757.2	85.6	8.56					
	2	17.66	16.06	27.37	31.71	28.84	0.099	5.017	26.2	17.7	161.1	25.9	2.59	11.15	0.064	0.923	Added Cl Recovered at ti (g)	= 175.4
6	1	15.03	13.61		31.83	28.83	0.104	5.012	28.1	20.6	186.9	25.4	2.54					
	2	22.27	20.21	33.82	32.74	29.71	0.102	5.019	23.7	14.2	128.9	26.0	2.60	5.15	0.029	0.953	Cl Recovery Ratio	= 0.738
7	1	19.83	17.91		33.86	30.59	0.107	5.019	20.9	10.5	95.7	17.1	1.71					
	2	16.59	15.04	32.95	35.82	32.49	0.103	5.020	17.0	6.5	58.6	8.8	0.88	2.60	0.015	0.967	Cl Translocated from Plot (g)	= 63.1
8	1	19.71	17.85		32.96	29.87	0.104	5.010	20.1	9.6	87.2	15.6	1.56					
	2	18.65	16.88	34.74	32.77	29.68	0.104	5.014	16.3	5.8	52.4	8.9	0.89	2.44	0.014	0.981	Cl Not Translocated (g)	= 112.3
9	1	17.19	15.56		33.30	30.16	0.104	5.006	17.4	6.8	62.1	9.7	0.97					
	2	19.54	17.67	33.23	35.06	31.72	0.106	5.018	15.3	4.9	44.8	7.9	0.79	1.76	0.010	0.991	Soil Volume Translocated (m3)	= 0.021
10	1	17.98	16.14		34.62	31.10	0.113	5.008	15.4	5.1	46.0	7.4	0.74					
	2	20.04	18.05	34.19	33.77	30.42	0.110	5.017	14.9	4.7	42.4	7.7	0.77	1.51	0.009	1.000	Soil Mass Translocated (kg)	= 33.7
11				352.1	37.02	33.53	0.104	5.007	20.7	10.3	93.9			175.38	1.000			

(extracted 03 91; analysed 08 91)

3 8 1	1	27.81	25.87		34.35	31.96	0.075	5.014	94.9	100.5	913.6	236.4	23.64					
	2	27.75	25.70	51.57	33.45	30.98	0.080	5.011	116.0	120.6	1096.9	281.9	28.19	51.82	0.210	0.210	Bulk Density at to (kg/m3)	= 1617
2	1	* 221.93	20.34		31.83	29.52	0.078	5.017	226.0	214.0	1944.4	395.5	39.55					
	2	21.51	20.01	40.35	35.75	33.26	0.075	5.012	185.9	181.0	1646.1	329.4	32.94	72.48	0.293	0.503	Background Cl (g/m2)	= 0
2	1	21.83	20.25		32.15	29.82	0.078	5.016	205.5	196.3	1783.7	361.1	36.11					
	2	13.11	12.17	32.42	35.06	32.56	0.077	5.005	198.2	190.7	1736.5	211.3	21.13	57.25	0.232	0.735	Cl Added to Plot (g)	= 237.5
4	1	22.62	21.32		33.44	31.53	0.061	5.012	69.5	77.6	705.5	150.4	15.04					
	2	24.38	22.70	44.02	35.16	32.75	0.074	5.011	128.5	132.1	1201.3	272.7	27.27	42.32	0.171	0.906	Total Cl Measured at ti (g)	= 247.2
5	1	25.27	23.73		32.89	30.89	0.065	5.017	30.6	34.3	311.9	74.0	7.40					
	2	22.03	20.67	44.39	36.48	34.23	0.066	5.015	33.3	37.8	343.4	71.0	7.10	14.50	0.059	0.964	Added Cl Recovered at ti (g)	= 247.2
6	1	24.84	23.36		35.54	33.43	0.063	5.017	18.8	20.1	182.8	42.7	4.27					
	2	26.57	24.89	48.25	35.28	33.05	0.067	5.018	11.4	5.4	49.1	12.2	1.22	5.49	0.022	0.987	Cl Recovery Ratio	= 1.041
7	1	18.37	17.08		36.88	34.31	0.075	5.012	11.7	5.8	52.9	9.0	0.90					
	2	20.99	19.61	36.69	35.44	33.11	0.070	5.004	9.9	3.4	31.3	6.1	0.61	1.52	0.006	0.993	Cl Translocated from Plot (g)	= 124.3
8	1	16.59	15.46		35.10	32.72	0.073	5.017	7.5	1.2	10.6	1.6	0.16					
	2	20.84	19.51	34.97	38.42	35.98	0.068	5.019	8.8	2.2	20.4	4.0	0.40	0.56	0.002	0.995	Cl Not Translocated (g)	= 122.9
9	1	24.29	22.65		34.44	32.13	0.072	5.014	8.3	1.8	16.3	3.7	0.37					
	2	18.80	17.54	40.20	36.41	33.98	0.071	5.019	7.1	0.8	7.3	1.3	0.13	0.50	0.002	0.997	Soil Volume Translocated (m3)	= 0.015
10	1	17.91	16.49		32.90	30.30	0.086	5.004	7.9	1.5	13.4	2.2	0.22					
	2	20.82	19.41	35.90	34.90	32.55	0.072	5.003	9.5	2.9	26.8	5.2	0.52	0.74	0.003	1.000	Soil Mass Translocated (kg)	= 24.7
11				408.8	34.00	31.84	0.068	5.020	9.5	3.0	27.4			247.17	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 07 91; analysed 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3 3	1 1	23.25	21.56		33.34	30.92	0.078	10.017	190.0	196.7	895.2	193.0	19.30					
	2	23.17	21.37	42.93	35.72	32.96	0.084	10.016	112.5	123.4	561.5	120.0	12.00	31.30	0.150	0.150	Bulk Density at to (kg/m3)	= 1615
	2 1	24.82	22.97		36.50	33.78	0.081	10.013	164.3	173.5	789.6	181.3	18.13					
	2	28.21	26.14	49.10	35.98	33.34	0.079	10.019	143.9	154.2	701.7	183.4	18.34	36.47	0.175	0.326	Background Cl (g/m2)	= 0
	3 1	24.51	22.58		36.56	33.68	0.085	10.020	181.4	189.1	860.0	194.2	19.42					
	2	21.36	19.77	42.35	34.59	32.03	0.080	10.015	184.2	191.6	871.9	172.4	17.24	35.66	0.176	0.502	Cl Added to Plot (g)	= 237.5
	4 1	21.62	19.83		35.36	32.43	0.090	10.020	285.6	287.5	1308.0	259.3	25.93					
	2	14.42	13.31	33.14	37.61	34.72	0.083	10.019	252.0	256.1	1165.0	155.0	15.50	41.44	0.199	0.701	Total Cl Measured at ti (g)	= 208.1
	5 1	22.01	20.24		38.34	35.26	0.087	10.019	246.1	250.5	1139.6	230.6	23.06					
	2	11.75	10.77	31.01	37.21	34.12	0.091	10.011	171.0	179.6	817.9	88.1	8.81	31.87	0.153	0.854	Added Cl Recovered at ti (g)	= 208.1
	6 1	20.10	18.43		39.15	35.90	0.090	10.012	91.5	101.8	463.7	85.4	8.54					
	2	15.68	14.35	32.78	38.96	35.67	0.092	10.005	87.5	97.5	444.1	63.7	6.37	14.92	0.072	0.926	Cl Recovery Ratio	= 0.876
	7 1	17.47	16.04		37.57	34.51	0.089	10.013	84.0	93.6	425.9	68.3	6.83					
	2	18.04	16.56	32.61	38.73	35.57	0.089	10.017	43.8	47.8	217.4	36.0	3.60	10.43	0.050	0.976	Cl Translocated from Plot (g)	= 67.8
	8 1	19.12	17.43		36.04	32.86	0.097	10.018	25.8	21.0	95.7	16.7	1.67					
	2	21.83	19.94	37.37	38.32	35.01	0.094	10.005	23.5	16.2	73.9	14.7	1.47	3.14	0.015	0.991	Cl Not Translocated (g)	= 140.3
	9 1	17.99	16.49		38.17	34.99	0.091	10.008	19.4	7.1	32.5	5.4	0.54					
	2	22.12	20.14	36.63	35.14	32.00	0.098	10.011	18.0	4.7	21.4	4.3	0.43	0.97	0.005	0.996	Soil Volume Translocated (m3)	= 0.026
	10 1	20.09	18.25		37.35	33.93	0.101	10.012	17.8	4.3	19.4	3.5	0.35					
	2	18.59	16.95	35.20	38.50	35.11	0.096	10.012	19.2	6.7	30.5	5.2	0.52	0.87	0.004	1.000	Soil Mass Translocated (kg)	= 42.6
	11			373.1	36.90	33.62	0.098	10.012	15.4	0.9	4.1			208.07	1.000			
3 9	1 1	21.59	19.49		38.14	34.44	0.108	10.014	16.3	3.4	15.3	3.0	0.30					
	2	22.01	19.86	39.35	35.50	32.04	0.108	10.014	43.6	0.0	0.0	0.0	0.00	0.30	0.003	0.003	Bulk Density at to (kg/m3)	= 1579
	2 1	17.27	15.63		37.68	34.12	0.104	10.020	165.7	174.4	793.5	124.1	12.41					
	2	20.38	18.37	34.01	36.89	33.26	0.109	10.010	36.2	35.2	160.4	29.5	2.95	15.35	0.131	0.133	Background Cl (g/m2)	= 0
	3 1	21.12	19.17		37.40	33.95	0.102	10.015	272.2	273.5	1244.9	238.6	23.86					
	2	21.87	19.67	38.84	37.93	34.13	0.111	10.011	93.5	103.9	473.0	93.1	9.31	33.17	0.283	0.416	Cl Added to Plot (g)	= 237.5
	4 1	17.07	15.26		42.98	38.45	0.118	10.015	84.5	94.1	428.2	65.4	6.54					
	2	18.58	16.75	32.02	36.31	32.75	0.109	10.012	250.5	254.7	1159.4	194.2	19.42	25.96	0.221	0.637	Total Cl Measured at ti (g)	= 117.4
	5 1	18.78	16.92		36.66	33.03	0.110	10.012	144.0	154.3	702.6	118.9	11.89					
	2	22.56	20.29	37.21	36.17	32.53	0.112	10.010	136.1	146.7	668.1	135.6	13.56	25.44	0.217	0.854	Added Cl Recovered at ti (g)	= 117.4
	6 1	19.90	17.92		41.23	37.13	0.110	10.016	47.2	52.4	238.3	42.7	4.27					
	2	18.54	16.67	34.59	40.92	36.81	0.112	10.011	76.8	85.5	389.2	64.9	6.49	10.76	0.092	0.946	Cl Recovery Ratio	= 0.494
	7 1	19.95	18.02		35.72	32.27	0.107	10.010	25.9	21.1	96.0	17.3	1.73					
	2	22.01	19.89	37.91	35.48	32.07	0.106	10.016	33.3	30.9	140.7	28.0	2.80	4.53	0.039	0.984	Cl Translocated from Plot (g)	= 15.6
	8 1	17.90	16.19		35.28	31.92	0.105	10.013	20.7	9.7	44.2	7.2	0.72					
	2	19.24	17.47	33.66	34.64	31.46	0.101	10.017	20.2	8.7	39.8	7.0	0.70	1.41	0.012	0.996	Cl Not Translocated (g)	= 101.7
	9 1	21.01	19.07		41.75	37.90	0.102	10.008	17.1	3.3	14.9	2.8	0.28					
	2	18.28	16.58	35.65	39.85	36.16	0.102	10.017	16.4	2.3	10.4	1.7	0.17	0.46	0.004	1.000	Soil Volume Translocated (m3)	= 0.032
	10 1	19.43	17.64		37.45	34.00	0.101	10.015	14.5	0.0	0.0	0.0	0.00					
	2	21.08	19.17	36.81	33.53	30.50	0.099	10.010						0.00	0.000	1.000	Soil Mass Translocated (kg)	= 50.8
	11			360.0	36.65	33.28	0.101	10.020						117.37	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, N to S)(extracted 07 91; analysed 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
3 1x 1	1	25.56	23.41		33.02	30.24	0.092	10.020	210.4	215.3	979.2	229.2	22.92					
	2	15.36	13.76	37.17	35.17	31.53	0.116	10.016	234.4	238.2	1083.8	149.2	14.92	37.84	0.201	0.201	Bulk Density at to (kg/m3)	= 1453
2	1	23.69	21.11		39.99	35.64	0.122	10.019	308.3	307.0	1396.8	294.8	29.48					
	2	18.00	16.04	37.15	38.41	34.23	0.122	10.015	315.6	314.2	1429.8	229.3	22.93	52.41	0.278	0.478	Background Cl (g/m2)	= 0
3	1	15.68	14.02		38.69	34.60	0.118	10.020	279.4	280.2	1274.5	178.6	17.86					
	2	17.61	15.74	29.75	39.79	35.57	0.119	10.016	259.8	262.0	1192.4	187.6	18.76	36.63	0.194	0.672	Cl Added to Plot (g)	= 237.5
4	1	20.93	18.73		39.60	35.45	0.117	10.006	348.4	346.1	1576.5	295.3	29.53					
	2	7.19	6.43	25.17	36.32	32.52	0.117	10.012	84.7	94.9	432.0	27.8	2.78	32.31	0.171	0.844	Total Cl Measured at ti (g)	= 188.7
5	1	12.87	11.47		40.50	36.11	0.122	10.020	121.6	132.6	603.4	69.2	6.92					
	2	13.86	12.75	24.22	38.04	35.00	0.087	10.016	43.7	49.2	224.1	28.6	2.86	9.78	0.052	0.895	Added Cl Recovered at ti (g)	= 188.7
6	1	18.56	16.96		40.46	36.98	0.094	10.010	43.2	48.5	220.9	37.5	3.75					
	2	8.92	7.97	24.93	39.76	35.55	0.119	10.015	23.8	20.6	93.5	7.5	0.75	4.49	0.024	0.919	Cl Recovery Ratio	= 0.794
7	1	21.01	18.71		41.95	37.36	0.123	10.017	33.1	32.7	148.6	27.8	2.78					
	2	5.81	5.20	23.90	33.91	30.37	0.117	10.013	18.3	7.2	32.6	1.7	0.17	2.95	0.016	0.935	Cl Translocated from Plot (g)	= 90.3
8	1	14.29	12.68		34.46	30.59	0.126	10.020	25.3	22.3	101.6	12.9	1.29					
	2	18.53	16.48	29.17	35.44	31.54	0.124	10.020	19.1	8.9	40.3	6.6	0.66	1.95	0.010	0.945	Cl Not Translocated (g)	= 98.4
9	1	16.68	14.85		35.97	32.04	0.123	10.013	18.2	6.9	31.4	4.7	0.47					
	2	10.72	9.55	24.40	35.21	31.38	0.122	10.017	206.6	211.6	962.8	91.9	9.19	9.66	0.051	0.996	Soil Volume Translocated (m3)	= 0.020
10	1	13.12	11.13		33.94	28.80	0.178	10.020	8.4	3.3	15.0	1.7	0.17					
	2	16.74	15.65	26.78	32.40	30.30	0.069	10.013	10.3	7.1	32.4	5.1	0.51	0.67	0.004	1.000	Soil Mass Translocated (kg)	= 29.6
11				282.6	35.13	31.28	0.123	10.020	8.3	3.2	14.5			188.69	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, S to N)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	------Laboratory Measurements------ Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 1	1 1	23.52	20.69		33.39	29.38	0.136	5.016	144.6	155.0	1408.9	291.6	29.16					
	2	21.87	19.18	39.87	35.96	31.54	0.140	5.005	43.0	41.9	381.5	73.2	7.32	36.47	0.215	0.215	Bulk Density at to (kg/m3)	= 1453
	2 1	19.39	17.02		36.01	31.61	0.139	5.020	142.1	152.7	1386.3	235.9	23.59					
	2	20.41	17.87	34.89	34.68	30.37	0.142	5.009	143.8	154.3	1404.0	250.9	25.09	48.68	0.287	0.501	Background Cl (g/m2)	= 0
	3 1	17.68	15.43		36.40	31.78	0.146	5.008	212.8	217.1	1976.1	304.9	30.49					
	2	19.24	16.97	32.40	33.57	29.62	0.133	5.011	152.5	162.4	1477.4	250.7	25.07	55.56	0.327	0.828	Cl Added to Plot (g)	= 237.5
	4 1	17.64	15.51		32.94	28.97	0.137	5.007	107.7	119.1	1084.0	168.1	16.81					
	2	17.66	15.56	31.07	38.55	33.97	0.135	5.018	20.6	10.2	92.8	14.4	1.44	18.26	0.107	0.936	Total Cl Measured at ti (g)	= 169.9
	5 1	18.35	16.05		37.00	32.37	0.143	5.017	59.0	63.0	572.7	91.9	9.19					
	2	16.55	14.50	30.55	33.56	29.42	0.141	5.018	16.7	6.2	56.4	8.2	0.82	10.01	0.059	0.995	Added Cl Recovered at ti (g)	= 169.9
	6 1	17.51	15.16		36.63	31.73	0.154	5.011	14.8	4.5	41.3	6.3	0.63					
	2	16.10	14.06	29.22	34.05	29.74	0.145	5.015	7.4	0.5	4.7	0.7	0.07	0.69	0.004	0.999	Cl Recovery Ratio	= 0.715
	7 1	15.39	13.43		32.52	28.39	0.146	5.008	7.5	0.5	4.9	0.7	0.07					
	2	15.91	13.95	27.37	33.10	29.03	0.140	5.019	5.7	0.1	0.7	0.1	0.01	0.07	0.000	0.999	Cl Translocated from Plot (g)	= 84.7
	8 1	17.01	14.92		34.01	29.85	0.140	5.011	4.6	0.0	0.0	0.0	0.00					
	2	16.83	14.72	29.64	34.10	29.83	0.143	5.015	5.5	0.0	0.4	0.1	0.01	0.01	0.000	0.999	Cl Not Translocated (g)	= 85.2
	9 1	18.44	16.12		34.79	30.41	0.144	5.014	5.3	0.0	0.0	0.0	0.00					
	2	16.52	14.48	30.59	33.02	28.94	0.141	5.013	6.2	0.2	1.6	0.2	0.02	0.02	0.000	0.999	Soil Volume Translocated (m3)	= 0.014
	10 1	14.75	12.97		34.79	30.59	0.137	5.011	6.9	0.4	3.2	0.4	0.04					
	2	19.47	17.05	30.01	40.86	35.78	0.142	5.017	6.9	0.4	3.2	0.6	0.06	0.10	0.001	1.000	Soil Mass Translocated (kg)	= 20.5
	11			315.6	32.44	28.39	0.142	5.011	16.6	3.4				169.88	1.000			
4 2	1 1	24.43	21.44		35.81	31.42	0.139	5.017	10.0	1.5	13.9	3.0	0.30					
	2	19.16	16.82	38.26	37.69	33.10	0.139	5.017	125.7	136.9	1244.1	209.3	20.93	21.23	0.143	0.143	Bulk Density at to (kg/m3)	= 1516
	2 1	18.20	15.91		35.91	31.41	0.143	5.010	149.8	159.9	1454.9	231.5	23.15					
	2	18.78	16.51	32.42	36.90	32.45	0.137	5.009	192.2	197.8	1799.8	297.2	29.72	52.87	0.355	0.498	Background Cl (g/m2)	= 0
	3 1	20.13	17.58		38.01	33.21	0.145	5.010	157.0	166.6	1515.5	266.4	26.64					
	2	17.82	15.61	33.19	37.44	32.80	0.141	5.017	111.7	123.1	1118.4	174.6	17.46	44.10	0.296	0.794	Cl Added to Plot (g)	= 237.5
	4 1	16.73	14.73		30.62	26.97	0.135	5.015	162.1	171.2	1556.3	229.3	22.93					
	2	13.70	11.74	26.47	34.47	29.56	0.166	5.019	19.3	8.7	79.2	9.3	0.93	23.86	0.160	0.955	Total Cl Measured at ti (g)	= 148.8
	5 1	13.45	11.85		37.20	32.78	0.135	5.014	51.6	54.5	495.5	58.7	5.87					
	2	21.15	18.63	30.47	35.45	31.23	0.135	5.015	9.8	1.4	12.8	2.4	0.24	6.11	0.041	0.996	Added Cl Recovered at ti (g)	= 148.8
	6 1	14.03	12.33		36.89	32.43	0.138	5.006	9.5	1.3	11.9	1.5	0.15					
	2	22.34	19.70	32.03	36.49	32.19	0.134	5.017	4.8	0.0	0.0	0.0	0.00	0.15	0.001	0.997	Cl Recovery Ratio	= 0.627
	7 1	14.15	12.42		34.83	30.58	0.139	5.013	7.2	0.4	4.1	0.5	0.05					
	2	17.39	15.22	27.64	36.48	31.94	0.142	5.009	6.0	0.1	1.2	0.2	0.02	0.07	0.000	0.997	Cl Translocated from Plot (g)	= 74.1
	8 1	16.10	14.15		36.05	31.70	0.138	5.004	4.7	0.0	0.0	0.0	0.00					
	2	20.12	17.75	31.90	33.45	29.53	0.133	5.010	4.6	0.0	0.0	0.0	0.00	0.00	0.000	0.997	Cl Not Translocated (g)	= 74.7
	9 1	24.10	21.16		30.29	26.60	0.139	5.008	4.5	0.0	0.0	0.0	0.00					
	2	13.70	12.06	33.22	34.28	30.17	0.136	5.005	2.9	0.0	0.0	0.0	0.00	0.00	0.000	0.997	Soil Volume Translocated (m3)	= 0.014
	10 1	14.44	12.72		35.38	31.16	0.135	5.003	14.4	2.5	23.2	3.0	0.30					
	2	15.92	14.04	26.76	31.72	27.99	0.133	5.007	12.9	1.1	9.9	1.4	0.14	0.43	0.003	1.000	Soil Mass Translocated (kg)	= 21.0
	11			312.4	34.01	29.82	0.141	5.011	15.6	5.2	47.0			148.81	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, S to N)(extracted 03 91; analysed 03 91)

Treatment	Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 3	1	1	24.11	20.63		33.50	28.68	0.168	5.019	83.9	95.1	863.7	178.2	17.82					
		2	24.92	21.40	42.03	35.67	30.63	0.164	5.018	47.9	54.0	490.4	104.9	10.49	28.32	0.180	0.180	Bulk Density at to (kg/m3)	= 1615
	2	1	17.81	15.27		34.07	29.22	0.166	5.017	136.8	150.2	1364.3	208.4	20.84					
		2	18.89	16.13	31.40	34.21	29.22	0.171	5.015	138.3	151.7	1378.4	222.4	22.24	43.07	0.274	0.454	Background Cl (g/m2)	= 0
	3	1	17.10	14.60		34.11	29.12	0.171	5.013	126.6	140.0	1272.6	185.8	18.58					
		2	16.83	14.47	29.06	35.67	30.67	0.163	5.018	153.8	166.8	1515.3	219.2	21.92	40.50	0.258	0.712	Cl Added to Plot (g)	= 237.5
	4	1	15.35	13.24		35.02	30.22	0.159	5.016	107.1	120.0	1090.5	144.4	14.44					
		2	15.64	13.44	26.68	36.33	31.24	0.163	5.005	86.8	98.4	896.5	120.5	12.05	26.49	0.169	0.881	Total Cl Measured at ti (g)	= 157.2
	5	1	17.61	15.27		31.95	27.70	0.153	5.013	39.6	41.7	379.3	57.9	5.79					
		2	17.36	15.09	30.35	37.38	32.49	0.150	5.012	36.8	37.2	338.4	51.1	5.11	10.90	0.069	0.950	Added Cl Recovered at ti (g)	= 157.2
	6	1	15.01	13.02		31.33	27.18	0.153	5.020	24.9	20.8	188.9	24.6	2.46					
		2	17.00	14.71	27.73	32.72	28.33	0.155	5.010	22.3	14.9	136.0	20.0	2.00	4.46	0.028	0.978	Cl Recovery Ratio	= 0.662
	7	1	14.29	12.46		34.69	30.26	0.147	5.018	17.3	4.6	42.0	5.2	0.52					
		2	17.71	15.38	27.84	32.94	28.61	0.151	5.020	17.4	4.8	43.5	6.7	0.67	1.19	0.008	0.986	Cl Translocated from Plot (g)	= 71.4
	8	1	15.20	13.25		33.28	29.03	0.146	5.014	17.8	5.4	48.7	6.5	0.65					
		2	15.74	13.71	26.97	35.53	30.96	0.148	5.013	16.2	2.8	25.6	3.5	0.35	1.00	0.006	0.992	Cl Not Translocated (g)	= 85.8
	9	1	15.71	14.32		35.73	32.58	0.097	5.003	16.0	2.6	23.5	3.4	0.34					
		2	18.40	16.75	31.07	33.18	30.22	0.098	5.008	16.9	3.9	35.9	6.0	0.60	0.94	0.006	0.998	Soil Volume Translocated (m3)	= 0.017
	10	1	16.90	15.35		35.03	31.83	0.100	5.014	14.9	1.0	9.2	1.4	0.14					
		2	16.77	15.33	30.69	33.24	30.40	0.093	5.011	15.0	1.1	10.0	1.5	0.15	0.29	0.002	1.000	Soil Mass Translocated (kg)	= 28.1
	11				303.8										157.15	1.000			
4 4	1	1	24.35	22.07		32.45	29.42	0.103	5.019	29.6	26.8	243.8	53.8	5.38					
		2	23.26	21.00	43.08	31.30	28.27	0.107	5.017	26.8	23.2	210.9	44.3	4.43	9.81	0.059	0.059	Bulk Density at to (kg/m3)	= 1727
	2	1	21.43	19.29		33.06	29.77	0.110	5.005	61.0	68.9	627.5	121.1	12.11					
		2	27.08	24.44	43.73	32.10	28.98	0.108	5.019	73.3	83.0	753.6	184.2	18.42	30.53	0.185	0.244	Background Cl (g/m2)	= 0
	3	1	21.88	19.66		30.71	27.60	0.113	5.015	109.8	122.8	1116.1	219.4	21.94					
		2	20.84	18.79	38.45	30.04	27.09	0.109	5.009	104.8	117.6	1070.2	201.1	20.11	42.05	0.254	0.498	Cl Added to Plot (g)	= 237.5
	4	1	20.52	20.38		31.46	31.26	0.006	5.016	105.5	118.3	1075.4	219.2	21.92					
		2	16.84	15.18	35.56	31.26	28.19	0.109	5.014	94.9	107.2	974.8	148.0	14.80	36.72	0.222	0.720	Total Cl Measured at ti (g)	= 165.4
	5	1	24.84	22.28		29.19	26.19	0.115	5.015	72.8	82.4	749.2	166.9	16.69					
		2	26.70	23.92	46.21	31.87	28.56	0.116	5.019	57.0	64.3	583.8	139.7	13.97	30.66	0.185	0.905	Added Cl Recovered at ti (g)	= 165.4
	6	1	18.02	16.27		29.91	27.01	0.107	5.015	25.1	21.1	191.3	31.1	3.11					
		2	24.20	21.84	38.10	31.59	28.51	0.108	5.013	35.1	34.7	315.3	68.8	6.88	10.00	0.060	0.966	Cl Recovery Ratio	= 0.697
	7	1	28.52	26.29		28.21	26.01	0.085	5.018	17.3	4.5	41.1	10.8	1.08					
		2	26.99	24.49	50.78	28.66	26.01	0.102	5.018	18.8	7.2	65.5	16.0	1.60	2.69	0.016	0.982	Cl Translocated from Plot (g)	= 40.3
	8	1	17.81	16.08		33.87	30.58	0.108	5.018	19.2	8.0	72.6	11.7	1.17					
		2	20.66	18.72	34.80	33.38	30.26	0.103	5.003	16.1	2.6	23.9	4.5	0.45	1.61	0.010	0.992	Cl Not Translocated (g)	= 125.1
	9	1	17.82	16.08		37.88	34.20	0.108	5.014	16.5	3.3	30.1	4.8	0.48					
		2	18.95	17.02	33.10	27.46	24.67	0.113	5.007	16.7	3.6	32.9	5.6	0.56	1.04	0.006	0.998	Soil Volume Translocated (m3)	= 0.027
	10	1	14.96	13.44		33.01	29.66	0.113	5.017	14.6	0.7	6.1	0.8	0.08					
		2	19.98	18.06	31.50	31.13	28.15	0.106	5.010	15.3	1.5	13.6	2.5	0.25	0.33	0.002	1.000	Soil Mass Translocated (kg)	= 46.6
	11				395.3										165.43	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, S to N)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	------Laboratory Measurements------: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 5 1	1	23.95	21.40		28.69	25.65	0.119	5.010	31.7	29.7	269.8	57.7	5.77					
	2	26.02	23.11	44.51	29.31	26.04	0.126	5.019	48.8	55.0	499.4	115.4	11.54	17.32	0.102	0.102	Bulk Density at to (kg/m3)	= 1784
2	1	19.91	17.92		29.37	26.44	0.111	5.019	122.1	135.4	1229.7	220.3	22.03					
	2	18.98	16.96	34.87	30.62	27.37	0.119	5.010	78.8	89.3	812.5	137.8	13.78	35.81	0.210	0.312	Background Cl (g/m2)	= 0
3	1	14.01	12.56		29.52	26.48	0.115	5.008	126.5	139.9	1273.0	159.9	15.99					
	2	24.55	22.16	34.72	31.70	28.61	0.108	5.012	123.1	136.4	1240.7	274.9	27.49	43.48	0.255	0.567	Cl Added to Plot (g)	= 237.5
4	1	13.49	12.17		29.55	26.65	0.109	5.012	94.7	107.1	973.6	118.4	11.84					
	2	21.56	19.19	31.36	30.02	26.73	0.123	5.016	106.5	119.4	1084.8	208.2	20.82	32.66	0.192	0.758	Total Cl Measured at ti (g)	= 170.5
5	1	14.64	12.85		30.33	26.64	0.138	5.007	77.1	87.3	794.5	102.1	10.21					
	2	20.49	18.63	31.48	31.88	28.98	0.100	5.010	46.5	52.3	476.2	88.7	8.87	19.08	0.112	0.870	Added Cl Recovered at ti (g)	= 170.5
6	1	13.29	12.12		30.90	28.20	0.096	5.006	29.1	26.1	237.9	28.8	2.88					
	2	22.63	20.51	32.63	34.33	31.11	0.103	5.020	28.4	25.3	229.3	47.0	4.70	7.59	0.044	0.915	Cl Recovery Ratio	= 0.718
7	1	24.36	21.83		31.70	28.41	0.116	5.013	16.3	3.0	27.4	6.0	0.60					
	2	11.44	10.27	32.10	32.09	28.82	0.113	5.017	16.2	2.8	25.2	2.6	0.26	0.86	0.005	0.920	Cl Translocated from Plot (g)	= 53.1
8	1	10.86	9.74		32.50	29.17	0.114	5.011	17.2	4.4	39.8	3.9	0.39					
	2	24.56	22.04	31.79	33.38	29.97	0.114	5.019	33.0	31.6	287.1	63.3	6.33	6.72	0.039	0.959	Cl Not Translocated (g)	= 117.4
9	1	22.43	20.17		28.81	25.92	0.112	5.010	19.2	8.1	73.6	14.9	1.49					
	2	20.41	18.43	38.61	34.07	30.78	0.107	5.014	21.0	11.8	107.7	19.9	1.99	3.47	0.020	0.979	Soil Volume Translocated (m3)	= 0.026
10	1	21.32	19.19		33.91	30.53	0.111	5.019	22.3	15.1	137.3	26.4	2.64					
	2	16.43	14.82	34.01	34.74	31.34	0.108	5.019	18.4	6.6	59.5	8.8	0.88	3.52	0.021	1.000	Soil Mass Translocated (kg)	= 47.1
11				346.1										170.50	1.000			
4 6 1	1	37.32	33.25		37.86	33.74	0.122	5.018	40.8	38.1	346.5	115.2	11.52					
	2	26.14	23.34	56.60	32.93	29.41	0.120	5.003	36.7	31.9	291.0	67.9	6.79	18.31	0.102	0.102	Bulk Density at to (kg/m3)	= 1720
2	1	28.11	25.07		33.49	29.87	0.121	5.016	148.4	158.6	1441.2	361.3	36.13					
	2	16.83	15.11	40.18	34.37	30.87	0.114	5.007	95.7	109.0	992.3	149.9	14.99	51.12	0.284	0.386	Background Cl (g/m2)	= 0
3	1	25.95	23.18		35.89	32.06	0.119	5.028	59.7	68.6	621.9	144.1	14.41					
	2	15.23	13.61	36.79	35.21	31.48	0.119	5.000	104.0	117.5	1071.4	145.8	14.58	29.00	0.161	0.547	Cl Added to Plot (g)	= 237.5
4	1	21.86	19.57		35.68	31.95	0.117	5.009	76.0	87.3	794.2	155.4	15.54					
	2	25.79	23.07	42.64	35.70	31.94	0.118	5.001	90.0	103.1	939.6	216.8	21.68	37.22	0.207	0.753	Total Cl Measured at ti (g)	= 180.1
5	1	25.97	23.50		35.44	32.08	0.105	5.011	59.0	67.8	616.8	144.9	14.49					
	2	19.61	17.62	41.12	36.30	32.62	0.113	5.012	61.4	70.6	642.0	113.1	11.31	25.81	0.143	0.897	Added Cl Recovered at ti (g)	= 180.1
6	1	24.00	21.71		36.01	32.58	0.106	5.009	28.6	25.0	227.6	49.4	4.94					
	2	22.60	20.52	42.23	36.76	33.39	0.101	5.021	31.8	29.7	269.9	55.4	5.54	10.48	0.058	0.955	Cl Recovery Ratio	= 0.758
7	1	27.04	24.58		39.59	36.00	0.100	5.013	19.6	8.1	74.0	18.2	1.82					
	2	23.80	21.57	46.15	36.09	32.72	0.103	5.018	20.5	10.0	91.0	19.6	1.96	3.78	0.021	0.976	Cl Translocated from Plot (g)	= 69.4
8	1	27.24	24.81		35.70	32.52	0.098	5.017	18.1	5.6	50.6	12.5	1.25					
	2	15.71	14.30	39.12	34.46	31.38	0.098	5.004	18.7	6.5	59.4	8.5	0.85	2.10	0.012	0.988	Cl Not Translocated (g)	= 110.6
9	1	27.87	25.35		35.33	32.14	0.099	5.007	16.2	2.6	23.4	5.9	0.59					
	2	22.53	20.52	45.86	36.27	33.03	0.098	5.018	16.4	2.9	26.0	5.3	0.53	1.13	0.006	0.994	Soil Volume Translocated (m3)	= 0.023
10	1	25.53	23.19		36.28	32.96	0.101	5.011	16.3	2.8	25.8	6.0	0.60					
	2	18.77	17.20	40.39	38.27	35.09	0.091	5.017	16.7	3.3	30.2	5.2	0.52	1.12	0.006	1.000	Soil Mass Translocated (kg)	= 39.5
11				431.1										180.07	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, $ to N)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 7 1	1	22.37	20.24		34.40	31.13	0.105	5.005	14.53	2.7	24.7	5.0	0.50					
	2	21.42	19.53	39.76	34.58	31.53	0.097	5.006	23.78	18.5	168.7	32.9	3.29	3.79	0.019	0.019	Bulk Density at to (kg/m3)	= 1660
2	1	21.18	19.28		36.05	32.82	0.098	5.006	51.19	57.9	526.9	101.6	10.16					
	2	20.52	18.69	37.97	33.31	30.35	0.098	5.012	90.94	103.4	940.0	175.7	17.57	27.73	0.136	0.154	Background Cl (g/m2)	= 0
3	1	20.85	18.87		35.43	32.08	0.105	5.008	185.2	190.8	1736.4	327.7	32.77					
	2	20.92	18.98	37.85	35.56	32.26	0.102	5.012	138.2	149.7	1361.4	258.3	25.83	58.60	0.287	0.442	Cl Added to Plot (g)	= 237.5
4	1	23.85	21.55		33.76	30.51	0.107	5.012	122.9	135.3	1230.0	265.0	26.50					
	2	17.77	16.06	37.60	34.07	30.79	0.107	5.011	136.6	148.2	1348.2	216.5	21.65	48.15	0.236	0.677	Total Cl Measured at ti (g)	= 204.1
5	1	20.98	18.89		31.46	28.33	0.110	5.015	69.93	79.4	721.5	136.3	13.63					
	2	22.10	19.97	38.85	34.48	31.15	0.107	5.010	60.77	68.8	626.3	125.0	12.50	26.13	0.128	0.805	Added Cl Recovered at ti (g)	= 204.1
6	1	22.71	20.55		34.41	31.15	0.105	5.012	49.7	56.2	510.8	105.0	10.50					
	2	24.13	21.82	42.37	34.65	31.34	0.106	5.020	42.92	47.5	431.5	94.1	9.41	19.91	0.098	0.903	Cl Recovery Ratio	= 0.859
7	1	22.01	19.83		31.39	28.29	0.110	5.019	31.57	29.4	266.8	52.9	5.29					
	2	24.71	22.41	42.24	32.81	29.75	0.103	5.012	24.91	20.6	187.4	42.0	4.20	9.49	0.046	0.949	Cl Translocated from Plot (g)	= 31.5
8	1	20.13	18.32		35.43	32.24	0.099	5.015	25.53	21.4	194.2	35.6	3.56					
	2	21.03	19.00	37.31	33.49	30.25	0.107	5.014	22.49	15.7	142.4	27.0	2.70	6.26	0.031	0.980	Cl Not Translocated (g)	= 172.6
9	1	21.14	19.14		38.08	34.49	0.104	5.011	19.82	10.4	94.7	18.1	1.81					
	2	21.04	19.09	38.23	34.77	31.56	0.102	5.008	16.28	7.8	71.0	13.6	1.36	3.17	0.016	0.996	Soil Volume Translocated (m3)	= 0.032
10	1	19.29	17.55		36.42	33.13	0.099	5.009	14.68	2.9	26.2	4.6	0.46					
	2	20.76	18.92	36.46	36.32	33.11	0.097	5.006	14.3	2.5	22.4	4.2	0.42	0.88	0.004	1.000	Soil Mass Translocated (kg)	= 53.3
11				388.7	34.48	31.52	0.094	5.008	16.97	5.8	52.9			204.11	1.000			
4 8 1	1	25.61	23.37		39.36	35.91	0.096	5.021	18.5	6.2	56.6	13.2	1.32					
	2	21.29	19.57	42.94	36.08	33.18	0.087	5.021	37.9	38.0	345.1	67.5	6.75	8.08	0.044	0.044	Bulk Density at to (kg/m3)	= 1617
2	1	23.71	21.74		38.75	35.54	0.090	5.012	53.8	59.7	543.2	118.1	11.81					
	2	26.71	24.54	46.28	36.89	33.89	0.088	5.008	126.1	137.6	1252.6	307.3	30.73	42.55	0.232	0.276	Background Cl (g/m2)	= 0
3	1	25.14	22.93		35.64	32.51	0.096	5.020	153.6	163.9	1488.2	341.3	34.13					
	2	12.05	11.02	33.95	37.00	33.85	0.093	5.020	103.4	114.9	1043.5	115.0	11.50	45.63	0.249	0.524	Cl Added to Plot (g)	= 237.5
4	1	17.05	15.53		37.45	34.12	0.098	5.005	88.4	99.4	905.2	140.6	14.06					
	2	23.33	21.29	36.82	39.70	36.24	0.096	5.008	128.4	139.9	1273.0	271.1	27.11	41.16	0.224	0.749	Total Cl Measured at ti (g)	= 183.5
5	1	22.98	20.64		39.54	35.52	0.113	5.006	83.7	94.0	855.6	176.6	17.66					
	2	18.93	17.74	38.38	39.40	36.94	0.067	5.015	43.4	47.0	427.5	75.8	7.58	25.24	0.138	0.886	Added Cl Recovered at ti (g)	= 183.5
6	1	24.07	21.85		36.70	33.32	0.101	5.010	35.6	34.5	313.6	68.5	6.85					
	2	13.10	11.82	33.68	35.01	31.61	0.107	5.008	24.6	20.0	182.0	21.5	2.15	9.01	0.049	0.935	Cl Recovery Ratio	= 0.773
7	1	22.74	20.45		38.91	34.99	0.112	5.011	21.6	12.5	114.0	23.3	2.33					
	2	15.58	14.10	34.55	39.02	35.32	0.105	5.017	42.5	45.5	413.0	58.2	5.82	8.15	0.044	0.980	Cl Translocated from Plot (g)	= 50.6
8	1	22.33	20.20		38.15	34.52	0.105	5.012	20.9	10.8	98.6	19.9	1.99					
	2	15.02	13.46	33.65	39.06	35.00	0.116	5.020	15.1	1.0	9.2	1.2	0.12	2.12	0.012	0.991	Cl Not Translocated (g)	= 132.9
9	1	23.63	21.21		37.97	34.09	0.114	5.003	17.3	4.1	37.4	7.9	0.79					
	2	16.66	15.10	36.32	34.76	31.53	0.103	5.018	18.0	5.3	47.7	7.2	0.72	1.51	0.008	0.999	Soil Volume Translocated (m3)	= 0.026
10	1	11.13	10.04		36.42	32.88	0.108	5.021	15.2	1.1	9.8	1.0	0.10					
	2	22.54	20.24	30.29	35.31	31.72	0.113	5.015	17.3		0.0	0.0	0.00	0.10	0.001	1.000	Soil Mass Translocated (kg)	= 42.4
11				366.9	32.88	29.69	0.108	5.005	15.7		0.0			183.54	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, S to N)(extracted 03 91; analysed 03 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 9	1 1	17.06	15.51		36.01	32.73	0.100	5.015	33.0	30.8	280.1	43.4	4.34	10.67	0.064	0.064	Bulk Density at to (kg/m3)	= 1579
	2	17.61	15.98	31.48	34.52	31.33	0.102	5.010	41.4	43.5	396.2	63.3	6.33					
	2 1	15.95	14.47		34.18	31.01	0.102	5.005	125.7	137.2	1249.8	180.8	18.08	27.86	0.166	0.230	Background Cl (g/m2)	= 0
	2	15.11	13.74	28.21	34.50	31.39	0.099	5.022	70.2	78.4	711.7	97.8	9.78					
	3 1	16.74	15.22		32.65	29.69	0.100	5.015	176.1	184.4	1676.1	255.0	25.50	49.96	0.298	0.528	Cl Added to Plot (g)	= 237.5
	2	15.62	14.23	29.45	33.01	30.09	0.097	5.012	181.2	188.9	1718.2	244.6	24.46					
	4 1	16.12	15.21		33.21	31.35	0.059	5.014	133.6	144.9	1317.4	200.4	20.04	45.56	0.272	0.800	Total Cl Measured at ti (g)	= 167.6
	2	16.97	15.43	30.64	34.47	31.35	0.100	5.008	173.1	181.7	1654.0	255.2	25.52					
	5 1	18.13	16.57		31.11	28.45	0.094	5.008	48.2	53.4	486.0	80.5	8.05	15.98	0.095	0.895	Added Cl Recovered at ti (g)	= 167.6
	2	14.46	13.12	29.69	32.79	29.76	0.102	5.009	59.6	66.4	604.1	79.3	7.93					
	6 1	17.75	16.27		37.38	34.28	0.090	5.007	42.1	44.8	407.9	66.4	6.64	11.64	0.069	0.965	Cl Recovery Ratio	= 0.706
	2	17.04	15.60	31.88	33.92	31.06	0.092	5.008	36.0	35.2	320.4	50.0	5.00					
	7 1	16.96	15.46		34.58	31.53	0.097	5.010	33.6	31.6	287.3	44.4	4.44	5.55	0.033	0.998	Cl Translocated from Plot (g)	= 38.5
	2	18.02	16.45	31.91	34.44	31.46	0.095	5.012	19.2	7.4	67.4	11.1	1.11					
	8 1	18.55	16.86		34.41	31.28	0.100	5.013	15.0	0.9	8.2	1.4	0.14	0.14	0.001	0.999	Cl Not Translocated (g)	= 129.1
	2	19.41	17.66	34.52	32.85	29.90	0.099	5.010	13.0	0.0	0.0	0.0	0.00					
	9 1	17.23	15.63		37.65	34.16	0.102	5.015	15.6	1.7	15.1	2.4	0.24	0.24	0.001	1.000	Soil Volume Translocated (m3)	= 0.025
	2	16.89	15.26	30.89	34.89	31.53	0.107	5.011	13.8	0.0	0.0	0.0	0.00					
	10 1	17.12	15.46		35.31	31.90	0.107	5.016	11.9	0.0	0.0	0.0	0.00					
	2	17.83	16.06	31.52	34.09	30.72	0.110	5.012	12.8	0.0	0.0	0.0	0.00	0.00	0.000	1.000	Soil Mass Translocated (kg)	= 39.8
	11			310.2	35.58	31.44	0.132	5.004	11.9	0.0	0.0			167.59	1.000			
4 10	1 1 *	140.82	36.91		33.99	30.75	0.106	5.022	52.4	58.2	527.8	194.8	19.48	19.60	0.120	0.120	Bulk Density at to (kg/m3)	= 1595
	2 *	124.12	21.96	58.87	35.09	31.96	0.098	5.023	14.7	0.6	5.1	1.1	0.11					
	2 1 *	122.42	20.21		35.84	32.32	0.109	5.020	87.7	98.6	895.0	180.9	18.09	28.11	0.172	0.172	Background Cl (g/m2)	= 0
	2 *	121.63	19.62	39.83	35.90	32.57	0.102	5.018	50.7	56.2	510.9	100.2	10.02					
	3 1 *	137.67	33.98		31.39	28.32	0.108	5.024	154.0	164.3	1490.4	506.5	50.65	61.19	0.374	0.666	Cl Added to Plot (g)	= 237.5
	2 *	122.25	19.86	53.84	35.88	32.03	0.120	5.014	52.6	58.4	531.1	105.5	10.55					
	4 1 *	126.80	23.90		36.84	32.87	0.121	5.014	31.1	28.2	256.0	61.2	6.12	24.52	0.150	0.816	Total Cl Measured at ti (g)	= 163.4
	2 *	122.95	20.63	44.53	34.67	31.17	0.112	5.013	87.3	98.1	891.7	184.0	18.40					
	5 1	17.71	15.89		33.59	30.14	0.114	5.029	47.9	53.1	481.2	76.4	7.64	17.63	0.108	0.924	Added Cl Recovered at ti (g)	= 163.4
	2	18.50	16.66	32.55	32.85	29.59	0.110	5.026	59.4	66.1	599.3	99.9	9.99					
	6 1	21.88	19.55		32.48	29.02	0.119	5.025	25.9	21.5	195.3	38.2	3.82	7.62	0.047	0.971	Cl Recovery Ratio	= 0.688
	2	16.12	14.65	34.19	34.45	31.31	0.100	5.029	31.5	28.6	259.6	38.0	3.80					
	7 1	22.18	19.80		33.51	29.92	0.120	5.023	20.8	10.7	96.8	19.2	1.92	4.60	0.028	0.999	Cl Translocated from Plot (g)	= 47.7
	2	18.54	16.75	36.55	33.12	29.92	0.107	5.023	23.8	17.7	160.4	26.9	2.69					
	8 1	22.68	20.27		34.43	30.77	0.119	5.021	13.8	0.0	0.0	0.0	0.00	0.06	0.000	0.999	Cl Not Translocated (g)	= 115.7
	2	16.62	14.94	35.21	37.42	33.64	0.112	5.013	14.7	0.5	4.2	0.6	0.06					
	9 1	18.61	16.68		33.83	30.34	0.115	5.022	14.1	0.0	0.0	0.0	0.00	0.00	0.000	0.999	Soil Volume Translocated (m3)	= 0.025
	2	23.64	21.12	37.80	35.93	32.11	0.119	5.020	14.1	0.0	0.0	0.0	0.00					
	10 1	23.17	20.66		36.91	32.92	0.121	5.031	14.8	0.6	5.3	1.1	0.11	0.11	0.001	1.000	Soil Mass Translocated (kg)	= 39.1
	2	20.22	18.17	38.83	35.07	31.52	0.112	5.031	12.3	0.0	0.0	0.0	0.00					
	11			412.2	36.46	32.79	0.112	5.020	12.4	0.0	0.0			163.44	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Moldboard Plow, S to N)(extracted 07 91; analysed 09 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	------Laboratory Measurements------ Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
4 1x	1 1	23.52	20.96		36.99	32.98	0.122	10.007	27.9	23.5	107.2	22.5	2.25					
	2	21.87	19.48	40.44	35.73	31.83	0.123	10.020	72.5	80.7	366.9	71.5	7.15	9.39	0.051	0.051	Bulk Density at to (kg/m3)	= 1453
	2 1	19.39	17.18		36.11	32.00	0.129	10.019	369.0	365.9	1664.7	285.9	28.59					
	2	20.41	18.09	35.27	31.42	27.86	0.128	10.019	279.7	282.1	1283.2	232.2	23.22	51.81	0.280	0.330	Background Cl (g/m2)	= 0
	3 1	17.68	15.70		41.72	37.07	0.125	10.015	346.2	344.6	1568.3	246.3	24.63					
	2	19.24	17.04	32.74	44.45	39.37	0.129	10.017	220.5	449.9	2047.0	348.7	34.87	59.50	0.321	0.651	Cl Added to Plot (g)	= 237.5
	4 1	17.64	15.67		36.27	32.22	0.126	10.016	356.1	353.9	1610.4	252.3	25.23					
	2	17.66	15.70	31.37	40.30	35.84	0.125	10.018	233.8	238.8	1086.4	170.6	17.06	42.29	0.228	0.879	Total Cl Measured at ti (g)	= 185.3
	5 1	18.35	16.23		35.49	31.41	0.130	10.014	137.9	148.5	675.8	109.7	10.97					
	2	16.55	14.64	30.87	38.20	33.79	0.130	10.020	45.1	50.1	227.9	33.3	3.33	14.30	0.077	0.957	Added Cl Recovered at ti (g)	= 185.3
	6 1	17.51	15.47		31.53	27.86	0.132	10.016	41.2	43.2	196.7	30.4	3.04					
	2	16.10	14.22	29.69	39.65	35.03	0.132	10.015	42.8	46.0	209.6	29.8	2.98	6.02	0.032	0.989	Cl Recovery Ratio	= 0.780
	7 1	15.39	13.62		40.61	35.95	0.130	10.019	22.0	12.5	57.0	7.8	0.78					
	2	15.91	14.03	27.65	34.75	30.66	0.134	10.013	18.5	5.5	25.0	3.5	0.35	1.13	0.006	0.995	Cl Translocated from Plot (g)	= 61.2
	8 1	17.01	15.01		40.24	35.51	0.133	10.019	17.6	4.0	18.4	2.8	0.28					
	2	16.83	14.87	29.88	35.28	31.19	0.131	10.020	18.3	5.2	23.5	3.5	0.35	0.62	0.003	0.999	Cl Not Translocated (g)	= 124.1
	9 1	18.44	16.30		36.23	32.04	0.131	10.015	15.9	1.6	7.1	1.2	0.12					
	2	16.52	14.60	30.90	31.98	28.26	0.131	10.016	15.3	0.7	3.2	0.5	0.05	0.16	0.001	0.999	Soil Volume Translocated (m3)	= 0.020
	10 1	14.75	13.08		34.46	30.56	0.127	10.018	15.6	1.2	5.3	0.7	0.07					
	2	19.47	17.26	30.34	38.47	34.11	0.128	10.011	15.1	0.6	2.5	0.4	0.04	0.11	0.001	1.000	Soil Mass Translocated (kg)	= 29.2
	11			319.1	38.09	33.57	0.135	10.016	17.5	3.8	17.3			185.35	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extracted 07 91; analysed 06 09 91)

Treatment	Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	1 Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
5	1	1 1	14.12	12.98		34.98	32.17	0.087	10.012	172.6	180.7	822.5	106.8	10.68					
		2	21.82	20.03	33.01	35.00	32.13	0.089	10.016	256.2	258.7	1177.1	235.7	23.57	34.25	0.293	0.293	Bulk Density at to (kg/m3)	= 1720
		2 1	17.02	15.65		35.74	32.87	0.087	10.019	294.1	293.6	1335.8	209.0	20.90					
		2	5.66	5.21	20.86	39.91	36.79	0.085	10.013	216.2	220.8	1005.2	52.4	5.24	26.14	0.223	0.516	Background Cl (g/m2)	= 0
		3 1	22.58	20.72		38.17	35.03	0.090	10.019	247.4	250.4	1139.2	236.0	23.60					
		2	8.46	7.74	28.45	40.62	37.18	0.093	10.018	77.4	86.9	395.4	30.6	3.06	26.66	0.228	0.744	Cl Added to Plot (g)	= 237.5
		4 1	13.44	12.33		35.95	32.98	0.090	10.015	91.2	101.9	463.5	57.1	5.71					
		2	13.83	12.70	25.03	35.17	32.32	0.088	10.019	47.0	53.2	242.1	30.8	3.08	8.79	0.075	0.819	Total Cl Measured at ti (g)	= 117.0
		5 1	21.03	19.28		37.46	34.35	0.090	10.017	33.2	32.9	149.5	28.8	2.88					
		2	9.42	8.65	27.93	36.78	33.80	0.088	10.019	44.4	50.3	228.9	19.8	1.98	4.86	0.042	0.861	Added Cl Recovered at ti (g)	= 117.0
		6 1	12.16	11.13		40.47	37.05	0.093	10.019	43.5	49.0	222.8	24.8	2.48					
		2	17.44	15.99	27.12	35.76	32.79	0.090	10.009	29.2	27.3	124.4	19.9	1.99	4.47	0.038	0.899	Cl Recovery Ratio	= 0.493
		7 1	11.45	10.44		39.61	36.12	0.097	10.017	35.3	35.9	163.1	17.0	1.70					
		2	21.04	19.23	29.67	39.13	35.77	0.094	10.012	35.6	36.4	165.6	31.8	3.18	4.89	0.042	0.941	Cl Translocated from Plot (g)	= 60.4
		8 1	13.69	12.51		33.60	30.72	0.094	10.014	34.1	34.1	155.2	19.4	1.94					
		2	17.24	15.79	28.30	39.34	36.04	0.092	10.020	27.4	24.9	113.5	17.9	1.79	3.73	0.032	0.973	Cl Not Translocated (g)	= 56.6
		9 1	12.94	11.84		36.46	33.36	0.093	10.015	26.5	23.8	108.2	12.8	1.28					
		2	14.57	13.32	25.16	38.65	35.34	0.094	10.006	21.3	14.2	64.7	8.6	0.86	2.14	0.018	0.991	Soil Volume Translocated (m3)	= 0.020
		10 1	10.53	9.60		34.14	31.15	0.096	10.014	21.9	15.7	71.6	6.9	0.69					
		2	21.72	19.84	29.44	39.11	35.74	0.094	10.016	16.7	4.1	18.6	3.7	0.37	1.06	0.009	1.000	Soil Mass Translocated (kg)	= 34.1
		11			275.0	36.87	33.71	0.094	10.019	294.0	293.5	1335.4			117.00	1.000			
5	2	1 1	21.00	18.66		34.69	30.83	0.125	10.019	17.9	6.3	28.8	5.4	0.54					
		2	21.29	19.02	37.68	40.22	35.94	0.119	10.020	325.9	324.2	1474.8	280.5	28.05	28.58	0.200	0.200	Bulk Density at to (kg/m3)	= 1784
		2 1	16.68	14.80		36.95	32.78	0.127	10.012	363.2	360.5	1641.0	242.8	24.28					
		2	18.66	16.67	31.46	41.93	37.46	0.119	10.020	377.2	374.0	1701.3	283.6	28.36	52.64	0.369	0.569	Background Cl (g/m2)	= 0
		3 1	18.30	16.37		40.12	35.90	0.117	10.015	171.7	179.9	818.6	134.0	13.40					
		2	16.06	14.30	30.67	38.81	34.56	0.123	10.016	227.0	231.1	1051.8	150.4	15.04	28.44	0.199	0.768	Cl Added to Plot (g)	= 237.5
		4 1	19.50	17.47		40.14	35.98	0.116	10.014	61.9	69.9	317.9	55.6	5.56					
		2	12.78	11.44	28.92	39.68	35.55	0.116	10.015	93.2	104.0	473.2	54.2	5.42	10.97	0.077	0.845	Total Cl Measured at ti (g)	= 142.8
		5 1	19.10	17.01		41.31	36.79	0.123	10.009	29.1	27.2	123.8	21.1	2.11					
		2	15.58	13.54	30.55	36.52	31.76	0.150	10.016	28.6	26.5	120.4	16.3	1.63	3.74	0.026	0.871	Added Cl Recovered at ti (g)	= 142.8
		6 1	18.85	16.87		36.47	32.65	0.117	10.017	55.0	62.2	282.9	47.7	4.77					
		2	14.94	13.35	30.21	42.42	37.90	0.119	10.018	34.8	35.2	160.1	21.4	2.14	6.91	0.048	0.919	Cl Recovery Ratio	= 0.601
		7 1	14.10	12.69		38.28	34.46	0.111	10.014	20.8	13.0	59.2	7.5	0.75					
		2	17.50	15.53	28.22	39.85	35.38	0.126	10.012	24.4	21.2	96.6	15.0	1.50	2.25	0.016	0.935	Cl Translocated from Plot (g)	= 81.2
		8 1	16.14	14.54		40.03	36.07	0.110	10.012	25.4	22.5	102.2	14.9	1.49					
		2	15.22	13.62	28.16	40.53	36.29	0.117	10.005	23.1	19.3	87.7	12.0	1.20	2.68	0.019	0.954	Cl Not Translocated (g)	= 61.6
		9 1	15.66	14.10		38.66	34.82	0.110	10.013	41.0	44.7	203.7	28.7	2.87					
		2	12.65	11.31	25.41	39.08	34.95	0.118	10.012	24.0	20.8	94.5	10.7	1.07	3.94	0.028	0.981	Soil Volume Translocated (m3)	= 0.018
		10 1	17.07	15.31		34.35	30.81	0.115	10.017	31.3	30.1	136.7	20.9	2.09					
		2	14.16	12.58	27.89	39.75	35.33	0.125	10.010	19.6	10.0	45.4	5.7	0.57	2.66	0.019	1.000	Soil Mass Translocated (kg)	= 31.8
		11			299.2	38.25	34.42	0.111	10.018	22.2	16.7	76.2			142.81	1.000			
										25.1	21.6								

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, N to S)(extracted 07 91; analysed 06 09 91)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	1 Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
5 3 1	1	18.16	16.60		43.81	40.06	0.094	10.006	169.4	353.6	1610.6	267.4	26.74					
	2	19.84	18.19	34.80	42.05	38.57	0.090	10.013	125.9	271.4	1235.5	224.8	22.48	49.22	0.276	0.276	Bulk Density at to (kg/m3)	= 1727
2	1	15.44	14.05		44.12	40.16	0.099	10.020	181.0	374.5	1703.4	239.3	23.93					
	2	18.59	16.91	30.96	38.42	34.97	0.099	10.020	218.2	444.4	2021.3	341.9	34.19	58.12	0.325	0.601	Background Cl (g/m2)	= 0
3	1	16.67	15.15		38.51	35.01	0.100	10.019	106.9	233.7	1063.0	161.0	16.10					
	2	16.78	15.79	30.94	39.30	36.98	0.063	10.020	77.7	162.3	738.4	116.6	11.66	27.76	0.155	0.757	Cl Added to Plot (g)	= 237.5
4	1	18.08	16.56		42.39	38.83	0.092	10.016	52.9	57.1	260.0	43.1	4.31					
	2	17.65	16.06	32.62	41.15	37.45	0.099	10.020	96.0	93.9	427.2	68.6	6.86	11.17	0.063	0.819	Total Cl Measured at ti (g)	= 178.6
5	1	18.88	17.24		38.07	34.78	0.095	10.010	63.4	67.3	306.5	52.9	5.29					
	2	16.45	15.04	32.28	38.91	35.59	0.093	10.015	28.9	31.4	143.1	21.5	2.15	7.44	0.042	0.861	Added Cl Recovered at ti (g)	= 178.6
6	1	13.66	12.82		43.57	40.90	0.065	10.010	46.7	50.8	231.2	29.6	2.96					
	2	17.51	15.95	28.77	39.92	36.37	0.098	10.018	64.7	68.6	312.1	49.8	4.98	7.94	0.044	0.905	Cl Recovery Ratio	= 0.752
7	1	15.06	13.81		37.75	34.61	0.091	10.015	49.6	55.1	250.8	34.6	3.46					
	2	14.91	13.61	27.42	41.15	37.58	0.095	10.018	47.3	52.6	239.3	32.6	3.26	6.72	0.038	0.943	Cl Translocated from Plot (g)	= 107.3
8	1	14.56	13.34		37.52	34.38	0.091	10.009	24.5	21.7	98.9	13.2	1.32					
	2	18.20	16.60	29.94	34.70	31.65	0.096	10.020	48.0	53.3	242.5	40.3	4.03	5.34	0.030	0.973	Cl Not Translocated (g)	= 71.2
9	1	14.57	13.34		35.32	32.36	0.092	10.020	19.7	11.0	50.1	6.7	0.67					
	2	15.60	14.37	27.71	41.02	37.79	0.086	10.020	28.8	26.9	122.3	17.6	1.76	2.43	0.014	0.986	Soil Volume Translocated (m3)	= 0.018
10	1	15.31	14.10		45.07	41.51	0.086	10.018	30.6	29.1	132.5	18.7	1.87					
	2	17.51	15.95	30.05	41.06	37.41	0.098	10.019	18.4	8.0	36.5	5.8	0.58	2.45	0.014	1.000	Soil Mass Translocated (kg)	= 30.3
11				305.5	39.17	36.03	0.087	10.010						178.58	1.000			
5 4 1	1	10.31	9.47		34.03	31.26	0.089	10.009	251.4	253.9	1156.4	109.5	10.95					
	2	19.17	17.57	27.04	35.46	32.52	0.091	10.019	166.8	173.7	790.3	138.9	13.89	24.83	0.126	0.126	Bulk Density at to (kg/m3)	= 1615
2	1	20.15	18.34		35.53	32.35	0.098	10.018	425.1	418.4	1903.7	349.2	34.92					
	2	16.47	15.05	33.39	36.26	33.14	0.094	10.019	401.7	397.0	1805.9	271.8	27.18	62.10	0.316	0.442	Background Cl (g/m2)	= 0
3	1	19.50	17.68		29.40	26.67	0.103	10.009	365.9	363.8	1656.7	292.9	29.29					
	2	18.33	16.60	34.28	35.33	32.00	0.104	10.014	297.8	299.5	1363.3	226.3	22.63	51.92	0.264	0.706	Cl Added to Plot (g)	= 237.5
4	1	20.54	18.74		41.69	38.05	0.096	10.005	179.7	185.1	843.4	158.1	15.81					
	2	18.24	16.60	35.35	35.81	32.60	0.098	10.020	113.5	123.5	561.6	93.3	9.33	25.13	0.128	0.834	Total Cl Measured at ti (g)	= 196.7
5	1	18.05	16.46		30.39	27.73	0.096	10.008	101.5	111.5	507.7	83.6	8.36					
	2	15.56	14.24	30.71	33.92	31.06	0.092	10.020	122.4	132.2	601.4	85.7	8.57	16.92	0.086	0.920	Added Cl Recovered at ti (g)	= 196.7
6	1	19.34	17.66		36.72	33.53	0.095	10.020	45.9	51.1	232.3	41.0	4.10					
	2	11.40	10.41	28.07	36.95	33.77	0.094	10.011	49.5	55.0	250.3	26.1	2.61	6.71	0.034	0.954	Cl Recovery Ratio	= 0.828
7	1	17.28	15.84		38.38	35.19	0.091	10.012	29.2	27.4	124.8	19.8	1.98					
	2	15.50	14.16	30.00	39.10	35.73	0.094	10.010	28.8	26.8	122.1	17.3	1.73	3.71	0.019	0.973	Cl Translocated from Plot (g)	= 86.9
8	1	18.13	16.65		37.87	34.79	0.089	10.019	24.4	21.6	98.1	16.3	1.63					
	2	12.67	11.57	28.22	39.19	35.82	0.094	10.010	28.8	26.9	122.4	14.2	1.42	3.05	0.016	0.988	Cl Not Translocated (g)	= 109.8
9	1	17.89	16.43		38.35	35.23	0.089	10.020	20.2	12.2	55.4	9.1	0.91					
	2	13.41	12.30	28.72	37.26	34.18	0.090	10.013	19.1	9.6	43.7	5.4	0.54	1.45	0.007	0.996	Soil Volume Translocated (m3)	= 0.020
10	1	13.82	12.69		34.00	31.24	0.089	10.010	17.6	6.3	28.8	3.7	0.37					
	2	16.33	16.45	29.14	35.43	35.69	-0.007	10.005	17.8	6.7	30.6	5.0	0.50	0.87	0.004	1.000	Soil Mass Translocated (kg)	= 31.6
11				304.9	36.70	33.78	0.087	10.007	17.7	6.6	30.0			196.69	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 03 91; analysed 17 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
6 1	1 1	19.56	17.75		34.32	31.15	0.101	5.005	65.8	139.3	1268.2	225.1	22.51					
	2	17.22	15.61	33.36	30.64	27.78	0.103	5.016	97.1	189.2	1719.3	268.4	26.84	49.35	0.407	0.407	Bulk Density at to (kg/m3)	= 1720
	2 1	14.76	13.30		33.45	30.16	0.109	5.016	10.1	6.5	58.8	7.8	0.78					
	2	16.34	14.82	28.12	32.53	29.52	0.102	5.008	11.5	10.1	91.7	13.6	1.36	2.14	0.018	0.425	Background Cl (g/m2)	= 0
	3 1	14.48	13.05		36.49	32.90	0.109	5.013	67.1	70.8	643.8	84.0	8.40					
	2	15.56	14.06	27.12	34.64	31.32	0.106	5.013	73.3	153.1	1392.1	195.8	19.58	27.98	0.231	0.656	Cl Added to Plot (g)	= 237.5
	4 1	16.31	14.76		34.35	31.10	0.104	5.008	43.2	46.9	427.3	63.1	6.31					
	2	14.36	13.00	27.76	39.24	35.53	0.104	5.018	54.3	58.4	530.8	69.0	6.90	13.21	0.109	0.765	Total Cl Measured at ti (g)	= 121.1
	5 1	13.59	12.32		32.19	29.19	0.103	5.020	38.3	41.9	380.0	46.8	4.68					
	2	16.70	15.10	27.42	33.47	30.28	0.106	5.014	36.9	40.4	367.2	55.4	5.54	10.23	0.084	0.849	Added Cl Recovered at ti (g)	= 121.1
	6 1	14.50	13.16		34.43	31.26	0.101	5.015	26.0	28.2	256.0	33.7	3.37					
	2	14.10	12.81	25.97	34.71	31.54	0.101	5.015	29.9	32.5	295.5	37.8	3.78	7.15	0.059	0.909	Cl Recovery Ratio	= 0.510
	7 1	15.66	14.23		32.72	29.73	0.100	5.015	14.4	13.9	126.1	17.9	1.79					
	2	15.77	14.30	28.52	37.92	34.39	0.103	5.019	16.8	17.3	157.0	22.4	2.24	4.04	0.033	0.942	Cl Translocated from Plot (g)	= 51.5
	8 1	16.75	15.21		34.61	31.44	0.101	5.020	12.1	10.8	98.4	15.0	1.50					
	2	17.59	16.16	31.37	32.25	29.63	0.088	5.008	14.7	14.3	130.2	21.0	2.10	3.60	0.030	0.972	Cl Not Translocated (g)	= 69.7
	9 1	17.88	16.30		35.95	32.79	0.096	5.020	12.7	11.5	104.6	17.1	1.71					
	2	14.59	13.35	29.65	36.18	33.11	0.093	5.011	9.6	5.5	49.7	6.6	0.66	2.37	0.020	0.991	Soil Volume Translocated (m3)	= 0.023
	10 1	16.93	15.41		37.79	34.40	0.098	5.019	8.8	3.6	32.8	5.1	0.51					
	2	18.49	16.89	32.30	33.14	30.29	0.094	5.011	8.8	3.7	33.7	5.7	0.57	1.08	0.009	1.000	Soil Mass Translocated (kg)	= 40.0
	11			291.6	38.40	35.17	0.092	5.019	11.6	10.3	93.1			121.1	1.000			
6 2	1 1	12.60	11.18		34.27	30.41	0.127	5.008	18.3	19.6	178.5	20.0	2.00					
	2	18.67	16.60	27.77	34.44	30.62	0.125	5.017	13.6	12.8	116.1	19.3	1.93	3.92	0.026	0.026	Bulk Density at to (kg/m3)	= 1784
	2 1	23.20	20.55		34.53	30.60	0.128	5.009	74.3	77.5	705.3	145.0	14.50					
	2	14.63	12.98	33.54	33.93	30.12	0.126	5.020	72.1	150.8	1368.9	177.7	17.77	32.27	0.212	0.238	Background Cl (g/m2)	= 0
	3 1	22.27	20.35		38.74	35.41	0.094	5.009	82.4	84.1	764.9	155.7	15.57					
	2	19.71	17.84	38.19	38.26	34.65	0.104	5.015	64.4	136.5	1240.5	221.4	22.14	37.70	0.248	0.485	Cl Added to Plot (g)	= 237.5
	4 1	20.27	18.57		34.17	31.31	0.091	5.019	43.8	47.6	432.5	80.3	8.03					
	2	18.80	17.00	35.57	41.92	37.91	0.106	5.014	59.7	63.8	579.9	98.6	9.86	17.89	0.117	0.603	Total Cl Measured at ti (g)	= 152.3
	5 1	18.86	17.21		35.02	31.96	0.096	5.019	30.6	33.4	302.9	52.1	5.21					
	2	21.73	19.79	37.00	40.76	37.13	0.098	5.017	26.2	28.5	258.8	51.2	5.12	10.33	0.068	0.671	Added Cl Recovered at ti (g)	= 152.3
	6 1	22.50	20.44		40.60	36.89	0.100	5.020	19.8	21.4	194.1	39.7	3.97					
	2	20.58	18.75	39.19	33.90	30.89	0.097	5.006	19.8	21.3	194.4	36.5	3.65	7.61	0.050	0.721	Cl Recovery Ratio	= 0.641
	7 1	16.09	14.64		39.43	35.90	0.098	5.019	19.6	21.1	191.9	28.1	2.81					
	2	19.91	18.08	32.72	39.34	35.73	0.101	5.003	18.0	19.1	174.4	31.5	3.15	5.96	0.039	0.760	Cl Translocated from Plot (g)	= 36.2
	8 1	13.12	11.70		35.71	31.87	0.121	5.017	24.7	26.8	243.3	28.5	2.85					
	2	19.82	18.10	29.80	35.40	32.33	0.095	5.018	16.1	16.2	147.2	26.6	2.66	5.51	0.036	0.796	Cl Not Translocated (g)	= 116.1
	9 1	16.64	14.87		36.47	32.59	0.119	5.010	20.1	21.7	197.6	29.4	2.94					
	2	17.10	15.26	30.13	37.32	33.32	0.120	5.009	18.1	19.2	175.0	26.7	2.67	5.61	0.037	0.833	Soil Volume Translocated (m3)	= 0.041
	10 1	17.51	15.69		35.33	31.66	0.116	5.019	114.3	105.2	955.5	149.9	14.99					
	2	13.60	11.80	27.49	35.76	31.04	0.152	5.014	101.6	97.6	887.4	104.7	10.47	25.46	0.167	1.000	Soil Mass Translocated (kg)	= 73.3
	11			331.4	33.68	30.12	0.118	5.008	115.8	106.0	965.1			152.28	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 03 91; analysed 17 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
6 3	1 1	11.36	10.31		35.72	32.42	0.102	5.007	56.9	63.0	573.4	59.1	5.91					
	2	20.13	18.03	28.34	31.88	28.56	0.116	5.007	29.6	27.3	248.2	44.8	4.48	10.38	0.052	0.052	Bulk Density at to (kg/m3)	= 1727
	2 1	15.99	14.30		39.50	35.32	0.118	5.025	171.4	178.6	1620.0	231.6	23.16					
	2	14.60	13.22	27.52	41.61	37.69	0.104	5.018	188.2	193.6	1758.7	232.5	23.25	46.41	0.231	0.283	Background Cl (g/m2)	= 0
	3 1	21.88	19.76		39.00	35.23	0.107	5.015	181.6	187.8	1706.6	337.2	33.72					
	2	9.75	8.79	28.55	37.11	33.47	0.109	5.014	240.2	243.5	2213.2	194.5	19.45	53.17	0.264	0.547	Cl Added to Plot (g)	= 237.5
	4 1	18.30	16.63		34.97	31.78	0.100	5.012	174.9	181.8	1653.0	274.9	27.49					
	2	15.28	13.86	30.49	39.58	35.91	0.102	5.011	150.5	159.3	1449.0	200.8	20.08	47.57	0.237	0.784	Total Cl Measured at ti (g)	= 201.0
	5 1	13.04	11.83		36.36	33.01	0.102	5.016	61.4	68.0	617.6	73.1	7.31					
	2	20.45	18.68	30.51	38.46	35.14	0.095	5.014	41.1	43.5	395.3	73.8	7.38	14.69	0.073	0.857	Added Cl Recovered at ti (g)	= 201.0
	6 1	10.91	9.91		40.59	36.90	0.100	5.010	32.3	27.8	253.3	25.1	2.51					
	2	21.49	19.48	29.40	40.89	37.08	0.103	5.010	33.1	31.9	289.8	56.5	5.65	8.16	0.041	0.897	Cl Recovery Ratio	= 0.846
	7 1	21.52	19.68		37.46	34.26	0.093	5.010	28.3	25.6	232.6	45.8	4.58					
	2	15.21	13.89	33.57	36.03	32.91	0.095	5.015	20.5	12.7	115.2	16.0	1.60	6.18	0.031	0.928	Cl Translocated from Plot (g)	= 56.8
	8 1	11.84	10.12		36.44	31.17	0.169	5.020	24.4	20.7	187.7	19.0	1.90					
	2	20.01	18.25	28.37	34.04	31.05	0.096	5.008	22.2	16.4	149.2	27.2	2.72	4.62	0.023	0.951	Cl Not Translocated (g)	= 144.2
	9 1	19.88	18.06		36.92	33.56	0.100	5.019	21.6	15.2	137.7	24.9	2.49					
	2	14.86	13.47	31.53	34.04	30.87	0.103	5.007	23.2	19.1	173.6	23.4	2.34	4.83	0.024	0.975	Soil Volume Translocated (m3)	= 0.027
	10 1	14.47	13.11		40.62	36.80	0.104	5.017	16.8	5.7	51.5	6.7	0.67					
	2	20.93	19.09	32.20	33.32	30.41	0.096	5.015	27.9	25.0	227.6	43.5	4.35	5.02	0.025	1.000	Soil Mass Translocated (kg)	= 46.9
	11			300.5	38.08	34.78	0.095	5.015	195.3	199.8	1816.2			201.02	1.000			
6 4	1 1	14.52	12.57		39.01	33.79	0.155	5.020	41.2	48.3	438.3	55.1	5.51					
	2	16.35	14.14	26.71	38.30	33.13	0.156	5.017	145.1	146.9	1334.2	188.6	18.86	24.37	0.139	0.139	Bulk Density at to (kg/m3)	= 1615
	2 1	13.96	12.04		38.48	33.19	0.159	5.016	309.5	287.2	2609.7	314.1	31.41					
	2	14.09	12.11	24.15	39.24	33.74	0.163	5.005	183.4	179.0	1630.2	197.4	19.74	51.15	0.292	0.431	Background Cl (g/m2)	= 0
	3 1	12.98	11.16		37.56	32.29	0.163	5.009	208.4	198.5	1806.2	201.5	20.15					
	2	12.99	11.12	22.28	37.63	32.23	0.167	5.014	281.6	263.1	2391.7	266.1	26.61	46.75	0.267	0.698	Cl Added to Plot (g)	= 237.5
	4 1	13.33	11.44		36.23	31.11	0.164	5.010	52.6	60.7	552.5	63.2	6.32					
	2	12.49	10.68	22.13	34.12	29.20	0.169	5.004	57.6	65.8	599.4	64.0	6.40	12.73	0.073	0.771	Total Cl Measured at ti (g)	= 175.1
	5 1	16.34	14.79		36.58	33.13	0.104	5.010	29.9	33.4	304.3	45.0	4.50					
	2	13.60	12.36	27.16	38.75	35.24	0.100	5.013	65.3	73.5	668.4	82.6	8.26	12.76	0.073	0.844	Added Cl Recovered at ti (g)	= 175.1
	6 1	14.88	13.47		34.96	31.66	0.104	5.015	44.3	52.0	472.3	63.6	6.36					
	2	14.04	12.71	26.19	37.50	33.96	0.104	5.017	47.3	55.2	501.2	63.7	6.37	12.73	0.073	0.917	Cl Recovery Ratio	= 0.737
	7 1	17.90	16.22		37.99	34.44	0.103	5.015	18.9	20.3	184.4	29.9	2.99					
	2	15.66	14.22	30.44	37.28	33.86	0.101	5.017	20.7	22.4	203.2	28.9	2.89	5.88	0.034	0.950	Cl Translocated from Plot (g)	= 75.5
	8 1	16.62	15.08		35.32	32.05	0.102	5.017	15.3	12.0	109.3	16.5	1.65					
	2	17.31	15.78	30.86	35.11	32.02	0.096	5.013	31.7	25.4	230.9	36.4	3.64	5.29	0.030	0.981	Cl Not Translocated (g)	= 99.6
	9 1	15.93	14.54		32.34	29.53	0.095	5.016	8.0	1.6	14.3	2.1	0.21					
	2	14.01	12.65	27.19	38.36	34.64	0.107	5.011	15.7	12.9	117.0	14.8	1.48	1.69	0.010	0.990	Soil Volume Translocated (m3)	= 0.023
	10 1	17.06	15.57		39.55	36.10	0.096	5.017	12.3	6.7	60.6	9.4	0.94					
	2	16.11	14.59	30.16	37.65	34.11	0.104	5.013	11.7	5.8	53.1	7.8	0.78	1.72	0.010	1.000	Soil Mass Translocated (kg)	= 36.3
	11			267.3	41.21	37.30	0.105	5.019	12.1	6.3	57.4			175.08	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 07 91; analysed 17 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
6 1x	1 1	19.56	17.83		34.11	31.10	0.097	10.011	100.3	220.3	1002.9	178.8	17.88					
	2	17.22	15.67	33.50	36.02	32.79	0.099	10.011	55.8	123.4	561.9	88.0	8.80	26.69	0.254	0.254	Bulk Density at to (kg/m3)	= 1720
	2 1	14.76	13.43		37.15	33.80	0.099	10.015	116.5	252.9	1150.9	154.5	15.45					
	2	16.34	14.83	28.25	36.75	33.36	0.102	10.018	81.8	180.9	822.8	122.0	12.20	27.65	0.263	0.516	Background Cl (g/m2)	= 0
	3 1	14.48	13.15		38.88	35.34	0.100	10.020	59.7	132.1	601.1	79.1	7.91					
	2	15.56	14.19	27.35	40.46	36.92	0.096	10.017	90.0	199.1	905.7	128.6	12.86	20.76	0.197	0.714	Cl Added to Plot (g)	= 237.5
	4 1	16.31	14.88		37.59	34.31	0.096	10.012	64.5	68.4	311.2	46.3	4.63					
	2	14.36	13.11	27.99	34.75	31.73	0.095	10.020	80.3	82.5	375.2	49.2	4.92	9.55	0.091	0.805	Total Cl Measured at ti (g)	= 105.2
	5 1	13.59	12.38		44.05	40.13	0.098	10.013	55.4	59.6	271.3	33.6	3.36					
	2	16.70	15.20	27.58	35.34	32.18	0.098	10.012	49.3	53.5	243.5	37.0	3.70	7.06	0.067	0.872	Added Cl Recovered at ti (g)	= 105.2
	6 1	14.50	13.18		33.19	30.18	0.100	10.013	38.3	42.1	191.8	25.3	2.53					
	2	14.10	12.86	26.04	37.34	34.07	0.096	10.012	48.2	52.3	238.2	30.6	3.06	5.59	0.053	0.925	Cl Recovery Ratio	= 0.443
	7 1	15.66	14.28		38.05	34.71	0.096	10.016	21.8	23.4	106.5	15.2	1.52					
	2	15.77	14.40	28.68	34.65	31.65	0.095	10.012	16.4	16.5	74.9	10.8	1.08	2.60	0.025	0.950	Cl Translocated from Plot (g)	= 54.3
	8 1	16.75	15.45		34.10	31.45	0.084	10.020	19.6	21.0	95.4	14.7	1.47					
	2	17.59	16.08	31.53	37.72	34.50	0.093	10.018	14.9	14.4	65.5	10.5	1.05	2.53	0.024	0.974	Cl Not Translocated (g)	= 50.9
	9 1	17.88	16.42		35.23	32.36	0.089	10.011	12.5	11.3	51.4	8.4	0.84					
	2	14.59	13.38	29.80	32.70	30.00	0.090	10.019	15.7	15.5	70.7	9.5	0.95	1.79	0.017	0.991	Soil Volume Translocated (m3)	= 0.020
	10 1	16.93	15.59		33.60	30.95	0.086	10.009	9.0	4.4	20.1	3.1	0.31					
	2	18.49	16.97	32.56	34.11	31.31	0.089	10.010	11.0	8.7	39.7	6.7	0.67	0.99	0.009	1.000	Soil Mass Translocated (kg)	= 33.6
	11			293.3	35.58	32.72	0.087	10.018	12.9	11.7	53.4			105.20	1.000			
6 2x	1 1	12.60	11.19		34.29	30.46	0.126	10.014	74.9	165.7	754.0	84.4	8.44					
	2	18.67	16.69	27.88	34.85	31.16	0.118	10.007	78.8	174.3	793.8	132.5	13.25	21.68	0.148	0.148	Bulk Density at to (kg/m3)	= 1784
	2 1	23.20	20.69		35.71	31.85	0.121	10.006	102.9	225.6	1027.5	212.5	21.25					
	2	14.63	13.03	33.72	31.52	28.08	0.122	10.017	164.2	344.1	1565.6	204.0	20.40	41.65	0.284	0.433	Background Cl (g/m2)	= 0
	3 1	22.27	19.86		34.30	30.59	0.121	10.007	105.6	231.0	1052.3	208.9	20.89					
	2	19.71	17.52	37.37	34.20	30.40	0.125	10.020	115.5	250.9	1141.2	199.9	19.99	40.88	0.279	0.712	Cl Added to Plot (g)	= 237.5
	4 1	20.27	18.04		31.46	28.01	0.123	10.011	84.9	86.0	391.6	70.7	7.07					
	2	18.80	16.77	34.81	34.83	31.08	0.121	10.012	68.8	72.4	329.7	55.3	5.53	12.59	0.086	0.798	Total Cl Measured at ti (g)	= 146.4
	5 1	18.86	16.70		34.73	30.76	0.129	10.012	54.5	58.7	267.2	44.6	4.46					
	2	21.73	19.35	36.05	34.06	30.34	0.123	10.019	44.5	48.6	221.1	42.8	4.28	8.74	0.060	0.857	Added Cl Recovered at ti (g)	= 146.4
	6 1	22.50	20.13		35.84	32.07	0.118	10.009	25.6	27.7	126.2	25.4	2.54					
	2	20.58	18.46	38.58	36.43	32.68	0.115	10.014	41.3	45.3	206.0	38.0	3.80	6.34	0.043	0.901	Cl Recovery Ratio	= 0.617
	7 1	16.09	14.31		34.04	30.29	0.124	10.011	33.7	37.0	168.4	24.1	2.41					
	2	19.91	17.69	32.00	34.63	30.77	0.125	10.020	25.6	27.7	126.1	22.3	2.23	4.64	0.032	0.932	Cl Translocated from Plot (g)	= 63.3
	8 1	13.12	11.88		37.59	34.05	0.104	10.007	26.7	29.0	132.0	15.7	1.57					
	2	19.82	17.65	29.53	35.12	31.28	0.123	10.013	27.1	29.4	133.7	23.6	2.36	3.93	0.027	0.959	Cl Not Translocated (g)	= 83.1
	9 1	16.64	14.91		34.82	31.21	0.116	10.020	16.0	15.9	72.5	10.8	1.08					
	2	17.10	15.34	30.25	36.62	32.85	0.115	10.017	36.1	39.8	181.0	27.8	2.78	3.86	0.026	0.986	Soil Volume Translocated (m3)	= 0.023
	10 1	17.51	15.75		37.04	33.32	0.112	10.011	16.2	16.2	73.8	11.6	1.16					
	2	13.60	12.21	27.95	33.79	30.34	0.114	10.013	16.7	16.9	77.1	9.4	0.94	2.10	0.014	1.000	Soil Mass Translocated (kg)	= 40.6
	11			328.1	34.62	31.05	0.115	10.014	13.0	11.9	54.1			146.43	1.000			

PRIMARY TILLAGE OPERATIONS 1990 (Chisel Plow, S to N)(extracted 07 91; analysed 17 09 91)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
6 3x 1	1	11.36	10.33		41.85	38.07	0.099	10.012	57.63	61.8	281.5	29.1	2.91					
	2	20.13	18.29	28.62	36.92	33.56	0.100	10.009	61.1	135.3	616.1	112.7	11.27	14.18	0.094	0.094	Bulk Density at to (kg/m3)	= 1727
2	1	15.99	14.64		38.27	35.05	0.092	10.018	134.4	287.9	1310.0	191.8	19.18					
	2	14.60	13.27	27.91	35.68	32.44	0.100	10.017	129.9	279.2	1270.5	168.6	16.86	36.04	0.240	0.334	Background Cl (g/m2)	= 0
3	1	21.88	19.84		40.09	36.37	0.102	10.015	132.1	283.5	1290.2	256.0	25.60					
	2	9.75	8.87	28.71	38.30	34.86	0.098	10.005	172.9	359.9	1639.7	145.5	14.55	40.15	0.267	0.601	Cl Added to Plot (g)	= 237.5
4	1	18.30	16.66		42.07	38.31	0.098	10.017	101.9	223.5	1017.1	169.4	16.94					
	2	15.28	13.92	30.57	42.24	38.48	0.098	10.008	67.0	148.2	674.9	93.9	9.39	26.33	0.175	0.777	Total Cl Measured at ti (g)	= 150.3
5	1	13.04	11.83		36.91	33.50	0.102	10.010	85.1	86.1	392.1	46.4	4.64					
	2	20.45	18.03	29.86	38.77	34.19	0.134	10.019	84.6	85.8	390.2	70.4	7.04	11.67	0.078	0.854	Added Cl Recovered at ti (g)	= 150.3
6	1	10.91	9.90		37.97	34.49	0.101	10.013	42.0	46.0	209.5	20.7	2.07					
	2	21.49	19.60	29.50	38.12	34.77	0.096	10.020	45.2	49.3	224.2	43.9	4.39	6.47	0.043	0.897	Cl Recovery Ratio	= 0.633
7	1	21.52	19.63		42.34	38.62	0.096	10.017	29.8	32.5	147.7	29.0	2.90					
	2	15.21	13.91	33.53	39.67	36.29	0.093	10.013	28.8	31.3	142.5	19.8	1.98	4.88	0.032	0.930	Cl Translocated from Plot (g)	= 50.2
8	1	11.84	10.91		41.18	37.95	0.085	10.008	27.3	29.6	134.9	14.7	1.47					
	2	20.01	18.29	29.20	44.16	40.38	0.094	10.010	21.7	23.3	106.1	19.4	1.94	3.41	0.023	0.952	Cl Not Translocated (g)	= 100.1
9	1	19.88	18.15		39.54	36.10	0.095	10.017	28.5	31.0	141.2	25.6	2.56					
	2	14.86	13.61	31.76	37.63	34.46	0.092	10.020	20.5	22.0	100.0	13.6	1.36	3.92	0.026	0.979	Soil Volume Translocated (m3)	= 0.026
10	1	14.47	13.19		41.75	38.05	0.097	10.003	19.4	20.7	94.5	12.5	1.25					
	2	20.93	19.08	32.27	38.35	34.97	0.097	10.016	21.2	22.8	103.8	19.8	1.98	3.23	0.021	1.000	Soil Mass Translocated (kg)	= 44.9
11				301.9	37.74	34.61	0.090	10.013	13.5	12.5	57.0			150.28	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
(extracted 09 91, analysed 25 05 92)																	
1 1 1 T	16.96	15.33		40.91	36.98	0.106	10.009	37.0	338.9	1543.2	236.5	23.65					
B	19.49	17.19	32.52	36.33	32.05	0.133	10.019	92.5	887.8	4039.0	694.4	69.44	93.09	0.220	0.220	Bulk Density at to (kg/m3)	= 1058
2 T	12.49	11.44		37.65	34.51	0.091	10.010	98.9	945.4	4304.9	492.6	49.26					
B	19.54	17.13	28.58	33.35	29.25	0.140	10.009	104.7	998.1	4545.2	778.7	77.87	127.13	0.301	0.521	Cl Added to Plot (g)	= 475
3 T	13.84	12.44		35.24	31.70	0.112	10.020	81.4	785.4	3572.9	444.6	44.46					
B	17.49	15.30	27.74	36.89	32.27	0.143	10.019	374.6	332.7	1513.6	231.6	23.16	67.62	0.160	0.681	Baseline Cl Removed (g)	= 0
4 T	14.16	12.86		41.00	37.26	0.101	10.014	56.5	551.0	2508.1	322.6	32.26					
B	17.07	15.32	28.18	30.05	26.98	0.114	10.012	111.7	106.5	484.7	74.3	7.43	39.68	0.094	0.775	Total Cl Measured at ti (g)	= 422.7
5 T	13.71	12.47		40.68	37.03	0.099	10.020	359.7	319.6	1453.6	181.3	18.13					
B	17.81	15.31	27.78	36.51	31.39	0.163	10.020	38.0	34.5	157.1	24.1	2.41	20.54	0.049	0.823	Added Cl Recovered at ti (g)	= 422.7
6 T	13.15	11.99		34.01	31.01	0.097	10.016	386.4	343.1	1561.5	187.2	18.72					
B	17.73	15.30	27.29	34.60	29.87	0.158	10.010	44.2	42.7	194.5	29.8	2.98	21.69	0.051	0.875	Cl Recovery Ratio	= 0.890
7 T	12.25	11.11		43.09	39.10	0.102	10.016	36.9	337.9	1537.7	170.9	17.09					
B	20.08	17.31	28.42	31.37	27.04	0.160	10.019	26.6	21.4	97.3	16.8	1.68	18.77	0.044	0.919	Cl Translocated from Plot (g)	= 202.5
8 T	13.78	12.54		37.32	33.98	0.098	10.019	331.4	294.6	1340.1	168.1	16.81					
B	18.07	15.51	28.05	32.47	27.87	0.165	10.015	15.8	4.5	20.4	3.2	0.32	17.12	0.041	0.960	Cl Not Translocated (g)	= 220.2
9 T	13.09	11.98		35.24	32.26	0.092	10.012	202.9	183.5	835.2	100.1	10.01					
B	15.67	13.43	25.41	38.74	33.20	0.167	10.020	21.9	15.2	69.3	9.3	0.93	10.94	0.026	0.986	Soil Volume Translocated (m3)	= 0.022
10 T	14.20	12.74		34.23	30.72	0.114	10.009	95.6	92.0	419.0	53.4	5.34					
B	16.90	14.47	27.21	32.93	28.20	0.168	10.012	20.1	11.6	52.7	7.6	0.76	6.10	0.014	1.000	Soil Mass Translocated (kg)	= 23.0
Totals			281.2										422.69	1.000			
(extracted 09 91, analysed 05 12 92)																	
1 2 1 T	13.02	11.97		38.01	34.95	0.088	10.016	217.3	441.2	2007.8	240.3	24.03					
B	13.21	11.49	23.46	34.22	29.77	0.149	10.005	161.3	861.1	3923.0	450.7	45.07	69.10	0.164	0.164	Bulk Density at to (kg/m3)	= 1077
2 T	10.77	9.85		41.14	37.65	0.093	10.017	214.1	1092.0	4968.7	489.5	48.95					
B	15.65	13.72	23.57	40.13	35.19	0.140	10.008	221.6	1127.8	5136.4	704.7	70.47	119.42	0.283	0.448	Cl Added to Plot (g)	= 475
3 T	13.16	12.09		42.16	38.75	0.088	10.014	159.7	176.1	801.7	96.9	9.69					
B	16.89	14.70	26.79	36.28	31.58	0.149	10.013	201.7	413.6	1882.9	276.7	27.67	37.37	0.089	0.536	Baseline Cl Removed (g)	= 0
4 T	9.97	9.15		36.92	33.89	0.089	10.007	47.4	55.7	253.9	23.2	2.32					
B	13.82	12.08	21.23	37.05	32.40	0.144	10.011	374.7	761.5	3467.2	418.9	41.89	44.21	0.105	0.641	Total Cl Measured at ti (g)	= 421.3
5 T	13.15	12.29		42.28	39.52	0.070	10.018	31.9	30.6	139.0	17.1	1.71					
B	12.51	10.89	23.18	29.76	25.91	0.149	10.012	300.8	572.2	2604.7	283.6	28.36	30.07	0.071	0.713	Added Cl Recovered at ti (g)	= 421.3
6 T	12.15	11.44		44.03	41.48	0.061	10.016	265.2	523.8	2383.6	272.7	27.27					
B	11.56	10.17	21.62	36.57	32.20	0.136	10.015	265.4	521.2	2372.2	241.4	24.14	51.41	0.122	0.835	Cl Recovery Ratio	= 0.887
7 T	11.31	10.75		40.33	38.36	0.051	10.011	259.8	515.8	2348.5	252.5	25.25					
B	13.50	11.87	22.62	40.36	35.50	0.137	10.012	69.9	79.7	362.9	43.1	4.31	29.56	0.070	0.905	Cl Translocated from Plot (g)	= 188.5
8 T	10.22	9.65		35.09	33.16	0.058	10.016	327.4	321.4	1462.7	141.2	14.12					
B	11.49	10.16	19.82	34.14	30.21	0.130	10.013	76.2	86.6	394.3	40.1	4.01	18.13	0.043	0.948	Cl Not Translocated (g)	= 232.7
9 T	13.32	12.33		40.61	37.61	0.080	10.017	266.2	263.8	1200.3	148.0	14.80					
B	9.33	8.13	20.46	35.84	31.24	0.147	10.010	24.5	20.3	92.6	7.5	0.75	15.56	0.037	0.985	Soil Volume Translocated (m3)	= 0.028
10 T	9.53	8.96		43.41	40.85	0.063	10.005	128.8	140.0	638.0	57.2	5.72					
B	10.66	9.29	18.25	36.63	31.94	0.147	10.018	23.2	17.0	77.6	7.2	0.72	6.44	0.015	1.000	Soil Mass Translocated (kg)	= 30.4
Totals			221.0										421.25	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 92)																
1 3	1 T	11.92	11.34		36.65	34.89	0.050	10.008	392.8	393.6	1792.5	203.3	20.33					
	B	16.57	14.81	26.16	36.50	32.64	0.118	10.017	159.9	856.8	3898.7	577.5	57.75	78.09	0.172	0.172	Bulk Density at to (kg/m3)	= 1086
	2 T	12.31	11.64		37.81	35.76	0.057	10.010	176.5	926.9	4220.6	491.3	49.13					
	B	13.58	12.04	23.68	32.68	29.00	0.127	10.016	199.6	993.9	4522.9	544.8	54.48	103.60	0.228	0.400	Cl Added to Plot (g)	= 475
	3 T	14.59	13.63		41.66	38.93	0.070	10.010	229.1	1100.5	5010.9	682.8	68.28					
	B	13.39	11.75	25.38	37.06	32.54	0.139	10.007	263.3	261.2	1189.7	139.8	13.98	82.27	0.181	0.581	Baseline Cl Removed (g)	= 0
	4 T	13.46	12.61		41.49	38.88	0.067	10.012	176.5	911.8	4151.2	523.4	52.34					
	B	13.85	12.03	24.64	39.64	34.45	0.151	10.020	56.7	65.1	296.2	35.6	3.56	55.90	0.123	0.704	Total Cl Measured at ti (g)	= 454.4
	5 T	13.70	12.68		42.14	39.01	0.080	10.015	293.6	566.4	2577.6	326.8	32.68					
	B	11.36	9.93	22.61	38.02	33.26	0.143	10.009	42.0	47.6	216.7	21.5	2.15	34.83	0.077	0.781	Added Cl Recovered at ti (g)	= 454.4
	6 T	12.16	11.47		45.13	42.57	0.060	10.010	326.4	633.0	2882.2	330.5	33.05					
	B	14.77	12.96	24.42	41.48	36.40	0.140	10.019	50.9	57.7	262.4	34.0	3.40	36.45	0.080	0.861	Cl Recovery Ratio	= 0.957
	7 T	11.78	11.05		45.12	42.33	0.066	10.014	263.1	517.4	2355.1	260.2	26.02					
	B	9.92	8.71	19.75	33.41	29.33	0.139	10.009	44.4	50.3	229.1	19.9	1.99	28.01	0.062	0.922	Cl Translocated from Plot (g)	= 181.7
	8 T	13.22	12.43		43.94	41.35	0.063	10.017	313.6	306.5	1394.5	173.4	17.34					
	B	12.11	10.57	23.01	36.18	31.60	0.145	10.010	24.7	21.1	95.9	10.1	1.01	18.35	0.040	0.963	Cl Not Translocated (g)	= 272.7
	9 T	11.65	11.05		45.74	43.42	0.054	10.011	194.1	197.0	896.9	99.1	9.91					
	B	13.31	11.66	22.71	38.88	34.08	0.141	10.015	26.8	23.7	107.7	12.6	1.26	11.17	0.025	0.987	Soil Volume Translocated (m3)	= 0.027
	10 T	11.88	11.20		44.61	42.09	0.060	10.017	87.2	99.0	450.4	50.5	5.05					
	B	10.74	9.38	20.59	38.18	33.37	0.144	10.019	22.2	15.6	71.0	6.7	0.67	5.71	0.013	1.000	Soil Mass Translocated (kg)	= 29.1
Totals				233.0										454.40	1.000			
		(extracted 09 91, analysed 25 05 92)																
1 4	1 T	13.98	13.27		33.85	32.15	0.053	10.011	357.0	317.2	1444.1	191.7	19.17					
	B	12.37	11.31	24.59	35.73	32.70	0.093	10.008	96.4	923.3	4205.1	475.8	47.58	66.74	0.180	0.180	Bulk Density at to (kg/m3)	= 1095
	2 T	15.07	14.13		34.07	31.96	0.066	10.005	93.6	897.2	4087.5	577.6	57.76					
	B	14.56	13.28	27.41	34.73	31.68	0.096	10.020	111.5	1059.0	4817.1	639.7	63.97	121.73	0.328	0.508	Cl Added to Plot (g)	= 475
	3 T	16.69	15.57		35.32	32.96	0.071	10.019	70.8	686.6	3123.7	486.4	48.64					
	B	15.59	14.09	29.66	34.02	30.76	0.106	10.018	346.5	307.9	1400.9	197.4	19.74	68.38	0.184	0.692	Baseline Cl Removed (g)	= 0
	4 T	14.01	13.51		38.31	36.96	0.037	10.020	64.5	627.4	2854.1	385.6	38.56					
	B	18.10	16.29	29.80	41.19	37.08	0.111	10.012	36.8	33.1	150.6	24.5	2.45	41.02	0.111	0.803	Total Cl Measured at ti (g)	= 371.0
	5 T	17.05	16.00		33.83	31.75	0.065	10.011	383.5	340.6	1550.6	248.1	24.81					
	B	17.14	15.46	31.46	34.90	31.50	0.108	10.010	24.7	19.4	88.5	13.7	1.37	26.18	0.071	0.873	Added Cl Recovered at ti (g)	= 371.0
	6 T	17.19	16.04		35.74	33.36	0.071	10.014	274.0	244.8	1114.2	178.7	17.87					
	B	17.51	15.91	31.95	33.80	30.72	0.100	10.014	20.0	11.3	51.3	8.2	0.82	18.69	0.050	0.924	Cl Recovery Ratio	= 0.781
	7 T	16.64	15.55		31.81	29.74	0.070	10.010	161.5	149.4	680.4	105.8	10.58					
	B	14.76	13.46	29.02	36.35	33.17	0.096	10.020	29.5	24.5	111.7	15.0	1.50	12.09	0.033	0.956	Cl Translocated from Plot (g)	= 188.5
	8 T	15.36	14.46		41.16	38.75	0.062	10.018	113.6	108.2	492.1	71.1	7.11					
	B	19.80	17.83	32.28	43.62	39.28	0.110	10.011	15.2	3.7	16.7	3.0	0.30	7.41	0.020	0.976	Cl Not Translocated (g)	= 182.5
	9 T	15.05	14.00		42.24	39.32	0.074	10.019	71.2	69.1	314.3	44.0	4.40					
	B	14.78	13.41	27.41	36.45	33.07	0.102	10.017	16.5	5.5	25.0	3.3	0.33	4.74	0.013	0.989	Soil Volume Translocated (m3)	= 0.020
	10 T	16.48	15.38		40.69	37.97	0.071	10.012	53.5	52.2	237.4	36.5	3.65					
	B	17.19	15.53	30.91	34.41	31.10	0.106	10.008	16.6	5.6	25.5	4.0	0.40	4.05	0.011	1.000	Soil Mass Translocated (kg)	= 21.6
Totals				294.5										371.02	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
1 5	1 T	12.00	11.37		35.97	34.09	0.055	10.020	327.9	322.0	1464.8	166.5	16.65					
	B	13.23	12.01	23.38	37.07	33.67	0.101	10.011	192.1	998.5	4546.0	546.1	54.61	71.26	0.180	0.180	Bulk Density at to (kg/m3)	= 1094
	2 T	14.39	13.45		33.04	30.89	0.070	10.011	195.0	1002.4	4564.1	613.8	61.38					
	B	14.81	13.52	26.97	30.80	28.12	0.095	10.015	217.3	1139.5	5186.1	701.1	70.11	131.50	0.333	0.513	Cl Added to Plot (g)	= 475
	3 T	12.86	12.01		32.07	29.96	0.071	10.017	190.2	988.4	4497.6	540.0	54.00					
	B	14.16	12.95	24.96	39.03	35.71	0.093	10.018	305.1	588.0	2675.3	346.4	34.64	88.65	0.224	0.737	Baseline Cl Removed (g)	= 0
	4 T	15.06	14.10		36.51	34.19	0.068	10.012	358.2	705.9	3213.8	453.2	45.32					
	B	18.61	17.10	31.20	38.61	35.48	0.088	10.018	54.9	62.2	283.2	48.4	4.84	50.16	0.127	0.864	Total Cl Measured at ti (g)	= 395.4
	5 T	16.28	14.90		37.90	34.71	0.092	10.017	31.0	29.3	133.4	19.9	1.99					
	B	13.10	12.02	26.93	37.85	34.75	0.089	10.020	25.6	22.2	100.9	12.1	1.21	3.20	0.008	0.872	Added Cl Recovered at ti (g)	= 395.4
	6 T	17.09	16.15		37.36	35.32	0.058	10.016	297.6	291.2	1325.2	214.0	21.40					
	B	17.60	16.01	32.16	37.29	33.93	0.099	10.010	22.9	17.7	80.5	12.9	1.29	22.69	0.057	0.929	Cl Recovery Ratio	= 0.832
	7 T	16.61	15.60		39.05	36.69	0.064	10.016	130.0	141.4	643.4	100.4	10.04					
	B	12.94	11.73	27.34	35.18	31.91	0.102	10.017	18.9	8.2	37.4	4.4	0.44	10.48	0.026	0.956	Cl Translocated from Plot (g)	= 202.8
	8 T	17.61	16.66		36.66	34.68	0.057	10.017	103.0	115.2	524.0	87.3	8.73					
	B	16.02	14.57	31.23	35.49	32.29	0.099	10.015	20.0	10.5	47.8	7.0	0.70	9.42	0.024	0.980	Cl Not Translocated (g)	= 192.7
	9 T	15.57	14.78		38.53	36.60	0.053	10.018	67.9	77.0	350.3	51.8	5.18					
	B	16.95	15.40	30.18	34.25	31.12	0.101	10.015	18.4	7.1	32.1	4.9	0.49	5.67	0.014	0.994	Soil Volume Translocated (m3)	= 0.018
	10 T	16.30	15.36		35.18	33.17	0.061	10.020	32.4	31.2	142.1	21.8	2.18					
	B	14.65	13.20	28.57	41.02	36.98	0.109	10.008	16.3	3.4	15.7	2.1	0.21	2.39	0.006	1.000	Soil Mass Translocated (kg)	= 19.5
Totals				282.9										395.42	1.000			
		(extracted 14 08 91, analysed 17 09 91)																
1 6	1 T	15.50	14.49		33.34	31.18	0.069	10.008	167.2	1047.4	4770.2	691.3	69.13					
	B	16.54	15.04	29.53	35.19	32.00	0.100	10.014	114.7	750.9	3417.7	513.9	51.39	120.52	0.425	0.425	Bulk Density at to (kg/m3)	= 1118
	2 T	15.33	14.30		30.07	28.06	0.072	10.020	41.2	262.7	1195.2	170.9	17.09					
	B	19.76	17.97	32.27	32.91	29.94	0.099	10.020	182.5	1128.2	5132.2	922.5	92.25	109.34	0.386	0.810	Cl Added to Plot (g)	= 475
	3 T	18.15	16.72		35.37	32.60	0.085	10.010	14.3	11.8	53.9	9.0	0.90					
	B	13.80	12.44	29.17	33.01	29.77	0.109	10.016	278.5	280.6	1277.0	158.9	15.89	16.79	0.059	0.870	Baseline Cl Removed (g)	= 0
	4 T	17.51	16.20		31.26	28.93	0.081	10.008	12.6	0.0	0.0	0.0	0.00					
	B	16.73	15.10	31.29	38.03	34.32	0.108	10.011	26.1	23.6	107.4	16.2	1.62	1.62	0.006	0.875	Total Cl Measured at ti (g)	= 283.6
	5 T	18.10	16.63		33.74	31.01	0.088	10.020	178.8	184.4	838.6	139.5	13.95					
	B	17.48	15.75	32.38	31.58	28.46	0.110	10.016	17.9	7.0	31.9	5.0	0.50	14.45	0.051	0.926	Added Cl Recovered at ti (g)	= 283.6
	6 T	17.55	16.13		36.99	34.00	0.088	10.015	109.4	119.4	543.4	87.6	8.76					
	B	19.67	17.63	33.76	38.67	34.67	0.115	10.012	18.5	8.4	38.1	6.7	0.67	9.43	0.033	0.960	Cl Recovery Ratio	= 0.597
	7 T	15.54	14.15		38.25	34.84	0.098	10.014	50.4	56.0	254.8	36.0	3.60					
	B	10.38	9.34	23.49	32.77	29.49	0.111	10.017	25.8	23.2	105.4	9.8	0.98	4.59	0.016	0.976	Cl Translocated from Plot (g)	= 229.9
	8 T	18.82	17.19		35.76	32.68	0.094	10.008	32.4	31.5	143.7	24.7	2.47					
	B	23.04	20.82	38.01	35.44	32.03	0.106	10.016	17.5	6.2	28.3	5.9	0.59	3.06	0.011	0.987	Cl Not Translocated (g)	= 53.8
	9 T	17.61	16.23		34.63	31.93	0.085	10.014	31.7	30.6	139.3	22.6	2.26					
	B	16.96	15.19	31.42	38.26	34.28	0.116	10.012	19.7	10.9	49.7	7.6	0.76	3.02	0.011	0.997	Soil Volume Translocated (m3)	= 0.009
	10 T	15.86	14.49		36.03	32.92	0.095	10.017	18.2	7.7	35.0	5.1	0.51					
	B	17.51	15.76	30.25	35.36	31.85	0.110	10.019	16.4	4.1	18.7	2.9	0.29	0.80	0.003	1.000	Soil Mass Translocated (kg)	= 10.3
Totals				311.6										283.61	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 09 91, analysed 06 12 91)																
1 7	1 T	15.34	14.87		39.19	37.99	0.032	10.016	379.6	374.7	1705.2	253.5	25.35					
	B	15.12	14.02	28.89	37.70	34.97	0.078	10.015	387.3	774.0	3522.6	493.9	49.39	74.74	0.201	0.201	Bulk Density at to (kg/m3)	= 1133
	2 T	15.52	14.82		33.44	31.94	0.047	10.009	257.4	1269.0	5778.8	856.3	85.63					
	B	17.12	15.90	30.72	34.05	31.64	0.076	10.009	238.9	1156.7	5267.7	837.6	83.76	169.39	0.455	0.656	Cl Added to Plot (g)	= 475
	3 T	15.09	14.36		35.03	33.35	0.050	10.015	201.4	1051.3	4784.8	687.2	68.72					
	B	19.53	18.16	32.52	37.63	35.00	0.075	10.010	338.6	334.1	1521.1	276.2	27.62	96.34	0.259	0.915	Baseline Cl Removed (g)	= 0
	4 T	13.46	12.86		40.63	38.82	0.047	10.014	328.4	324.0	1474.6	189.6	18.96					
	B	15.12	13.98	26.84	39.72	36.74	0.081	10.010	32.0	25.2	114.6	16.0	1.60	20.56	0.055	0.970	Total Cl Measured at ti (g)	= 372.1
	5 T	16.89	16.01		37.63	35.68	0.055	10.011	109.9	129.2	588.4	94.2	9.42					
	B	17.67	16.54	32.55	35.26	33.02	0.0[illegible]	10.018	20.6	4.9	22.4	3.7	0.37	9.79	0.026	0.997	Added Cl Recovered at ti (g)	= 372.1
	6 T	16.78	15.54		38.95	36.08	0.[illegible]	10.012	18.4	2.3	10.4	1.6	0.16					
	B	18.90	17.49	33.02	37.07	34.30	0.081	10.010	19.9	4.0	18.3	3.2	0.32	0.48	0.001	0.998	Cl Recovery Ratio	= 0.783
	7 T	17.09	16.44		41.33	39.77	0.039	10.010	21.1	5.6	25.6	4.2	0.42					
	B	17.11	15.70	32.14	36.45	33.46	0.089	10.015	17.1	1.0	4.6	0.7	0.07	0.49	0.001	0.999	Cl Translocated from Plot (g)	= 244.1
	8 T	18.30	17.56		43.39	41.66	0.042	10.012	17.8	1.6	7.4	1.3	0.13					
	B	21.52	19.75	37.31	42.49	38.99	0.090	10.013	16.8	0.7	3.0	0.6	0.06	0.19	0.001	1.000	Cl Not Translocated (g)	= 127.9
	9 T	17.76	16.59		42.91	40.09	0.070	10.012	17.1	1.0	4.5	0.7	0.07					
	B	20.64	19.09	35.68	41.64	38.53	0.081	10.010	15.2	0.0	0.0	0.0	0.00	0.07	0.000	1.000	Soil Volume Translocated (m3)	= 0.009
	10 T	22.44	21.27		37.88	35.91	0.055	10.009	16.0	0.0	0.0	0.0	0.00					
	B	21.30	20.14	41.41	38.45	36.36	0.057	10.012	15.8	0.0	0.0	0.0	0.00	0.00	0.000	1.000	Soil Mass Translocated (kg)	= 10.6
Totals				331.1										372.06	1.000			
		(extracted 10 91, analysed 05 12 91)																
1 8	1 T	16.02	15.07		38.51	36.23	0.063	10.018	228.8	1153.5	5248.1	790.8	79.08					
	B	13.28	12.34	27.41	34.49	32.06	0.076	10.017	399.3	784.9	3571.5	440.7	44.07	123.15	0.283	0.283	Bulk Density at to (kg/m3)	= 1112
	2 T	17.72	16.54		36.30	33.89	0.071	10.011	333.3	1600.2	7285.5	1205.0	******					
	B	19.56	17.99	34.53	36.05	33.16	0.087	10.013	162.4	848.1	3860.5	694.5	69.45	189.95	0.436	0.719	Cl Added to Plot (g)	= 475
	3 T	15.73	14.65		32.39	30.18	0.073	10.020	182.5	950.3	4322.7	633.4	63.34					
	B	16.62	15.29	29.94	37.14	34.18	0.087	10.011	321.5	315.0	1434.4	219.3	21.93	85.27	0.196	0.914	Baseline Cl Removed (g)	= 0
	4 T	19.27	17.96		35.19	32.80	0.073	10.015	213.0	214.2	975.0	175.1	17.51					
	B	17.07	15.62	33.58	35.75	32.73	0.092	10.017	29.3	27.0	122.9	19.2	1.92	19.43	0.045	0.959	Total Cl Measured at ti (g)	= 435.8
	5 T	17.54	16.59		37.48	35.45	0.057	10.010	82.3	93.4	425.4	70.6	7.06					
	B	16.94	15.53	32.12	36.00	33.01	0.090	10.016	41.9	46.1	209.9	32.6	3.26	10.32	0.024	0.982	Added Cl Recovered at ti (g)	= 435.8
	6 T	17.55	16.31		37.54	34.90	0.076	10.014	46.1	52.2	237.7	38.8	3.88					
	B	18.75	17.25	33.56	39.04	35.93	0.087	10.020	18.4	7.2	32.7	5.6	0.56	4.44	0.010	0.993	Cl Recovery Ratio	= 0.917
	7 T	19.22	18.26		37.30	35.44	0.053	10.014	24.3	20.6	94.0	17.2	1.72					
	B	18.43	16.80	35.06	38.93	35.51	0.096	10.016	16.9	4.4	19.8	3.3	0.33	2.05	0.005	0.997	Cl Translocated from Plot (g)	= 313.1
	8 T	18.87	17.70		36.55	34.30	0.066	10.011	18.6	7.5	33.9	6.0	0.60					
	B	17.46	15.88	33.58	36.93	33.61	0.099	10.013	15.8	2.7	12.4	2.0	0.20	0.80	0.002	0.999	Cl Not Translocated (g)	= 122.7
	9 T	19.84	18.57		44.33	41.50	0.068	10.010	14.8	1.3	5.9	1.1	0.11					
	B	16.67	15.27	33.84	35.51	32.54	0.091	10.010	15.1	1.7	7.6	1.2	0.12	0.23	0.001	1.000	Soil Volume Translocated (m3)	= 0.008
	10 T	20.45	19.25		37.39	35.21	0.062	10.008	15.0	1.5	6.9	1.3	0.13					
	B	16.61	15.23	34.48	35.68	32.73	0.090	10.019	13.7	0.0	0.0	0.0	0.00	0.13	0.000	1.000	Soil Mass Translocated (kg)	= 9.2
Totals				328.1										435.76	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
1 9	1 T	16.87	15.76		43.40	40.57	0.070	10.019	256.4	512.9	2333.4	367.8	36.78					
	B	11.00	9.88	25.65	38.10	34.24	0.113	10.012	164.8	879.2	4002.4	395.5	39.55	76.34	0.186	0.186	Bulk Density at to (kg/m3)	= 1075
	2 T	13.63	12.70		33.03	30.78	0.073	10.017	200.8	1010.2	4596.5	583.6	58.36					
	B	12.92	11.63	24.33	37.41	33.70	0.110	10.015	229.7	1135.5	5167.9	601.2	60.12	118.47	0.289	0.475	Cl Added to Plot (g)	= 475
	3 T	16.35	14.87		42.11	38.31	0.099	10.020	170.5	917.1	4171.8	620.3	62.03					
	B	12.46	11.13	26.00	40.60	36.27	0.119	10.018	266.0	515.5	2345.4	260.9	26.09	88.13	0.215	0.690	Baseline Cl Removed (g)	= 0
	4 T	14.51	13.21		39.72	36.18	0.098	10.008	403.1	811.0	3693.4	488.0	48.80					
	B	13.40	11.88	25.09	37.23	33.01	0.128	10.018	72.9	82.7	376.1	44.7	4.47	53.26	0.130	0.820	Total Cl Measured at ti (g)	= 409.8
	5 T	13.86	12.63		31.37	28.59	0.097	10.012	241.5	491.0	2235.4	282.3	28.23					
	B	13.12	11.62	24.25	36.69	32.51	0.129	10.011	39.8	42.7	194.4	22.6	2.26	30.49	0.074	0.895	Added Cl Recovered at ti (g)	= 409.8
	6 T	15.23	13.78		37.88	34.30	0.104	10.014	326.5	320.5	1458.7	201.1	20.11					
	B	12.49	10.98	24.77	35.98	31.65	0.137	10.020	28.3	25.6	116.5	12.8	1.28	21.39	0.052	0.947	Cl Recovery Ratio	= 0.863
	7 T	12.51	11.31		37.21	33.66	0.105	10.013	98.9	111.0	505.3	57.2	5.72					
	B	14.87	13.05	24.36	34.09	29.93	0.139	10.020	26.4	23.2	105.6	13.8	1.38	7.09	0.017	0.964	Cl Translocated from Plot (g)	= 194.8
	8 T	14.16	12.87		42.68	38.79	0.100	10.018	111.1	123.2	560.5	72.1	7.21					
	B	13.91	12.33	25.20	33.75	29.93	0.128	10.015	21.3	13.4	61.0	7.5	0.75	7.96	0.019	0.984	Cl Not Translocated (g)	= 215.0
	9 T	13.27	12.46		41.98	39.42	0.065	10.018	62.7	71.1	323.6	40.3	4.03					
	B	14.01	12.57	25.03	38.48	34.54	0.114	10.009	17.1	4.8	21.8	2.7	0.27	4.31	0.011	0.994	Soil Volume Translocated (m3)	= 0.019
	10 T	13.34	12.61		36.74	34.74	0.058	10.012	35.7	36.2	164.7	20.8	2.08					
	B	15.66	13.95	26.56	37.97	33.85	0.122	10.016	21.3	4.1	18.8	2.6	0.26	2.34	0.006	1.000	Soil Mass Translocated (kg)	= 20.8
Totals				251.2										409.78	1.000			
		(extracted 10 91, analysed 05 12 91)																
1 10	1 T	15.73	13.91		42.43	37.54	0.130	10.013	297.5	606.8	2762.0	384.2	38.42					
	B	14.33	12.55	26.46	40.36	35.35	0.142	10.008	219.9	1131.2	5152.1	646.4	64.64	103.06	0.242	0.242	Bulk Density at to (kg/m3)	= 1080
	2 T	15.64	13.97		36.34	32.48	0.119	10.014	201.2	980.8	4464.4	623.8	62.38					
	B	13.07	11.57	25.55	40.65	36.01	0.129	10.018	244.6	1198.6	5453.3	631.1	63.11	125.50	0.294	0.536	Cl Added to Plot (g)	= 475
	3 T	16.95	15.12		37.47	33.43	0.121	10.020	174.4	897.8	4083.9	617.4	61.74					
	B	14.48	12.78	27.90	33.73	29.79	0.132	10.011	199.7	418.3	1904.7	243.5	24.35	86.08	0.202	0.738	Baseline Cl Removed (g)	= 0
	4 T	15.96	14.22		40.09	35.73	0.122	10.018	256.7	524.6	2386.7	339.4	33.94					
	B	15.44	13.50	27.72	45.43	39.75	0.143	10.018	83.0	100.1	455.3	61.5	6.15	40.09	0.094	0.832	Total Cl Measured at ti (g)	= 426.5
	5 T	13.61	12.26		34.44	31.05	0.109	10.016	260.7	509.2	2317.1	284.1	28.41					
	B	20.32	17.79	30.05	39.86	34.90	0.142	10.014	28.2	21.9	99.5	17.7	1.77	30.19	0.071	0.902	Added Cl Recovered at ti (g)	= 426.5
	6 T	18.39	16.48		39.79	35.66	0.116	10.010	249.1	251.0	1142.9	188.3	18.83					
	B	17.50	15.27	31.74	36.15	31.55	0.146	10.016	23.6	9.8	44.7	6.8	0.68	19.51	0.046	0.948	Cl Recovery Ratio	= 0.898
	7 T	14.58	13.08		36.56	32.80	0.115	10.013	129.0	146.8	668.1	87.4	8.74					
	B	15.63	13.68	26.76	42.72	37.40	0.142	10.016	23.5	9.6	43.9	6.0	0.60	9.34	0.022	0.970	Cl Translocated from Plot (g)	= 228.6
	8 T	15.51	14.03		38.23	34.60	0.105	10.012	76.3	91.5	416.4	58.4	5.84					
	B	11.40	10.04	24.07	40.93	36.06	0.135	10.014	26.4	18.2	82.9	8.3	0.83	6.67	0.016	0.986	Cl Not Translocated (g)	= 197.9
	9 T	17.15	15.39		36.08	32.38	0.114	10.012	37.2	38.0	173.1	26.6	2.66					
	B	16.32	14.25	29.63	36.05	31.48	0.145	10.009	22.7	7.5	34.1	4.9	0.49	3.15	0.007	0.993	Soil Volume Translocated (m3)	= 0.017
	10 T	16.99	15.49		36.27	33.09	0.096	10.020	40.0	36.1	164.4	25.5	2.55					
	B	13.25	11.64	27.14	41.46	36.44	0.138	10.017	22.5	6.9	31.6	3.7	0.37	2.92	0.007	1.000	Soil Mass Translocated (kg)	= 18.9
Totals				277.0										426.50	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 09 91, analysed 17 09 91)																
1 11	1 T	16.89	15.54		38.50	35.44	0.087	10.017	367.5	365.1	1661.2	258.2	25.82					
	B	20.25	18.10	33.64	32.69	29.23	0.119	10.012	374.0	742.2	3378.9	611.6	61.16	86.97	0.220	0.220	Bulk Density at to (kg/m3)	= 1069
	2 T	15.68	14.35		38.21	34.99	0.092	10.009	412.9	815.6	3714.2	533.1	53.31					
	B	14.71	13.01	27.36	34.92	30.89	0.131	10.013	375.2	744.5	3388.9	440.8	44.08	97.39	0.247	0.247	Cl Added to Plot (g)	= 475
	3 T	16.61	15.29		38.67	35.61	0.086	10.009	336.5	670.8	3054.5	467.1	46.71					
	B	15.55	13.69	28.99	31.64	27.87	0.135	10.014	255.4	256.7	1168.5	160.0	16.00	62.71	0.159	0.625	Baseline Cl Removed (g)	= 0
	4 T	17.08	15.58		34.67	31.64	0.096	10.015	277.4	558.0	2539.4	395.7	39.57					
	B	15.28	13.42	29.01	37.57	33.01	0.138	10.019	39.9	41.9	190.4	25.6	2.56	42.13	0.107	0.732	Total Cl Measured at ti (g)	= 395.0
	5 T	18.19	16.62		37.56	34.32	0.094	10.018	342.9	340.9	1550.9	257.7	25.77					
	B	16.28	14.24	30.86	35.19	30.79	0.143	10.019	18.9	10.0	45.6	6.5	0.65	26.42	0.067	0.799	Added Cl Recovered at ti (g)	= 395.0
	6 T	16.72	15.22		39.30	35.79	0.098	10.012	297.0	295.9	1347.1	205.0	20.50					
	B	14.95	13.09	28.32	35.54	31.14	0.141	10.012	18.6	9.3	42.4	5.5	0.55	21.06	0.053	0.852	Cl Recovery Ratio	= 0.832
	7 T	16.89	15.35		36.66	33.34	0.100	10.015	246.1	247.9	1128.1	173.2	17.32					
	B	15.66	13.32	28.68	35.49	30.21	0.175	10.016	45.9	50.7	230.9	30.8	3.08	20.40	0.052	0.904	Cl Translocated from Plot (g)	= 184.4
	8 T	14.58	13.36		37.86	34.70	0.091	10.020	224.5	227.2	1033.3	138.0	13.80					
	B	16.51	15.32	28.68	37.68	34.97	0.077	10.016	18.5	9.2	41.9	6.4	0.64	14.45	0.037	0.941	Cl Not Translocated (g)	= 210.7
	9 T	17.83	16.16		32.77	29.72	0.103	10.018	166.9	174.3	793.0	128.2	12.82					
	B	20.05	17.51	33.67	37.88	33.09	0.145	10.013	18.5	9.2	42.1	7.4	0.74	13.55	0.034	0.975	Soil Volume Translocated (m3)	= 0.028
	10 T	15.12	13.82		34.16	31.23	0.094	10.018	139.1	148.7	676.7	93.5	9.35					
	B	12.99	11.36	25.18	38.80	33.96	0.143	10.019	19.6	11.5	52.3	5.9	0.59	9.95	0.025	1.000	Soil Mass Translocated (kg)	= 29.9
Totals				294.4										395.02	1.000			
		(extracted 09 91, analysed 24 09 91)																
1 12	1 T	17.89	17.06		40.56	38.69	0.376	10.014	255.7	260.7	1186.7	202.4	20.24					
	B	20.96	19.41	36.46	34.15	31.63	0.080	10.017	395.9	391.1	1779.6	345.4	34.54	54.78	0.220	0.220	Bulk Density at to (kg/m3)	= 1067
	2 T	16.36	15.57		31.23	29.74	0.050	10.011	316.9	312.3	1422.0	221.5	22.15					
	B	14.23	13.25	28.82	39.22	36.52	0.074	10.012	410.5	405.7	1847.0	244.7	24.47	46.61	0.187	0.407	Cl Added to Plot (g)	= 475
	3 T	17.97	17.10		36.81	35.02	0.051	10.015	259.7	264.1	1201.8	205.5	20.55					
	B	20.73	19.06	36.15	33.57	30.87	0.088	10.020	338.5	333.8	1518.6	289.4	28.94	49.49	0.198	0.605	Baseline Cl Removed (g)	= 0
	4 T	17.40	16.55		33.51	31.89	0.051	10.010	389.8	385.0	1753.1	290.2	29.02					
	B	14.35	13.12	29.67	34.63	31.67	0.094	10.015	59.1	66.0	300.6	39.4	3.94	32.96	0.132	0.737	Total Cl Measured at ti (g)	= 249.4
	5 T	18.62	17.73		34.44	32.81	0.050	10.012	256.0	261.0	1188.1	210.7	21.07					
	B	18.35	16.78	34.52	35.20	32.21	0.093	10.020	22.1	9.7	44.2	7.4	0.74	21.81	0.087	0.825	Added Cl Recovered at ti (g)	= 249.4
	6 T	16.28	15.43		36.20	34.32	0.055	10.017	206.1	217.3	989.0	152.6	15.26					
	B	11.73	10.72	26.15	41.79	38.20	0.094	10.011	29.9	28.4	129.5	13.9	1.39	16.65	0.067	0.891	Cl Recovery Ratio	= 0.525
	7 T	18.12	17.10		37.50	35.41	0.059	10.013	106.0	120.0	546.1	93.4	9.34					
	B	13.75	12.58	29.69	33.96	31.09	0.092	10.018	22.9	11.7	53.3	6.7	0.67	10.01	0.040	0.931	Cl Translocated from Plot (g)	= 101.4
	8 T	15.57	14.69		40.09	37.85	0.059	10.013	79.7	90.8	413.1	60.7	6.07					
	B	14.20	13.02	27.71	34.79	31.91	0.090	10.010	20.3	5.8	26.3	3.4	0.34	6.41	0.026	0.957	Cl Not Translocated (g)	= 148.0
	9 T	18.13	14.69		38.33	31.06	0.234	10.018	82.0	93.6	425.7	62.5	6.25					
	B	14.83	13.59	28.28	34.32	31.47	0.091	10.019	19.6	4.3	19.7	2.7	0.27	6.52	0.026	0.983	Soil Volume Translocated (m3)	= 0.025
	10 T	16.15	15.28		32.49	30.74	0.057	10.006	49.7	55.1	250.9	38.3	3.83					
	B	13.97	12.79	28.07	38.30	35.07	0.092	10.016	20.2	5.6	25.4	3.2	0.32	4.16	0.017	1.000	Soil Mass Translocated (kg)	= 26.9
Totals				305.5										249.40	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot
		(extracted 09 91, analysed 12 91)															
1 1	1 B	19.49	17.19		36.33	32.05	0.133	10.019	172.1	873.7	3975.0	873.7	835.6				
	2 B	19.54	17.13	34.32	33.35	29.25	0.140	10.009	212.1	1079.7	4916.8	1079.7	939.4				
	3 T	13.84	12.44		35.24	31.70	0.112	10.020	154.9	847.8	3856.7	847.8	739.2				
	4 T	14.16	12.86		41.00	37.26	0.101	10.014	284.1	556.2	2531.7	556.2	518.6				
	5 T	13.71	12.47		40.68	37.03	0.099	10.020	110.3	245.6	1117.4	245.6	300.8				
		(extracted 09 91, analysed 12 91)															
1 4	1 B	12.37	11.31	11.31	35.73	32.70	0.093	10.008	195.8	977.2	4450.4	977.2	869.0				
	2 T	15.07	14.13		34.07	31.96	0.066	10.005	164.7	911.0	4150.0	911.0	844.5				
	2 B	14.56	13.28	27.41	34.73	31.68	0.096	10.020	216.6	1069.2	4863.8	1069.2	996.7				
	3 T	16.69	15.57		35.32	32.96	0.071	10.019	366.1	726.2	3303.6	726.2	646.2				
	4 T	14.01	13.51		38.31	36.96	0.037	10.020	335.0	656.1	2984.4	656.1	590.5				

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
2 1 1	T	16.78	15.28		34.14	31.10	0.098	10.016	235.8	236.3	1075.5	164.4	16.44					
	B	19.56	17.00	32.28	31.87	27.70	0.151	10.009	183.7	953.4	4341.7	737.9	73.79	90.23	0.235	0.235	Bulk Density at to (kg/m3)	= 1058
2	T	13.80	12.42		37.45	33.72	0.110	10.003	346.6	697.6	3178.6	394.9	39.49					
	B	17.36	15.08	27.50	39.68	34.52	0.149	10.005	194.9	974.3	4438.8	669.4	66.94	106.43	0.278	0.513	Cl Added to Plot (g)	= 475
3	T	14.23	13.09		39.09	35.98	0.087	10.015	287.8	551.2	2508.7	328.4	32.84					
	B	14.93	13.09	26.18	39.21	34.39	0.140	10.015	404.0	406.2	1848.7	242.0	24.20	57.05	0.149	0.662	Baseline Cl Removed (g)	= 0
4	T	14.81	13.28		33.42	29.97	0.115	10.020	213.3	424.5	1930.9	256.3	25.63					
	B	16.17	13.93	27.20	37.63	32.43	0.161	10.005	94.9	106.5	485.3	67.6	6.76	32.39	0.084	0.746	Total Cl Measured at ti (g)	= 383.5
5	T	18.09	16.24		40.60	36.46	0.114	10.015	325.8	319.7	1455.0	236.3	23.63					
	B	20.11	17.27	33.51	35.79	30.74	0.164	10.011	58.6	67.2	305.9	52.8	5.28	28.91	0.075	0.821	Added Cl Recovered at ti (g)	= 383.5
6	T	16.44	14.83		37.50	33.83	0.108	10.010	272.7	269.6	1227.5	182.0	18.20					
	B	16.16	13.89	28.71	42.47	36.51	0.163	10.012	35.2	35.7	162.6	22.6	2.26	20.46	0.053	0.875	Cl Recovery Ratio	= 0.807
7	T	15.43	14.03		33.65	30.60	0.100	10.019	259.6	257.9	1173.2	164.6	16.46					
	B	14.92	12.80	26.82	35.95	30.84	0.166	10.010	28.3	25.3	115.2	14.7	1.47	17.93	0.047	0.922	Cl Translocated from Plot (g)	= 186.8
8	T	16.77	15.09		35.99	32.39	0.111	10.017	141.7	152.2	692.4	104.5	10.45					
	B	17.89	15.38	30.48	30.86	26.55	0.163	10.012	24.7	20.6	93.6	14.4	1.44	11.89	0.031	0.953	Cl Not Translocated (g)	= 196.7
9	T	18.40	16.59		41.93	37.81	0.109	10.009	78.5	89.1	405.6	67.3	6.73					
	B	17.62	15.18	31.77	37.28	32.13	0.160	10.015	26.7	23.2	105.4	16.0	1.60	8.33	0.022	0.974	Soil Volume Translocated (m3)	= 0.023
10	T	18.29	16.43		34.78	31.24	0.113	10.016	90.8	102.3	465.7	76.5	7.65					
	B	19.33	16.76	33.19	36.57	31.71	0.153	10.019	31.1	29.3	133.4	22.4	2.24	9.88	0.026	1.000	Soil Mass Translocated (kg)	= 24.2
Totals				297.6										383.50	1.000			
		(extracted 09 91, analysed 05 12 91)																
2 2 1	T	11.90	11.37		44.63	42.68	0.046	10.018	377.3	376.2	1711.8	194.7	19.47					
	B	14.96	13.33	24.70	31.38	27.96	0.122	10.013	202.7	1033.7	4705.5	627.1	62.71	82.18	0.184	0.184	Bulk Density at to (kg/m3)	= 1077
2	T	14.07	13.27		43.80	41.32	0.060	10.016	226.0	1140.7	5191.2	688.8	68.88					
	B	14.27	12.62	25.89	41.08	36.34	0.130	10.020	229.1	1130.8	5143.9	649.2	64.92	133.79	0.300	0.485	Cl Added to Plot (g)	= 475
3	T	15.57	14.60		46.02	43.15	0.066	10.015	248.8	1215.4	5531.4	807.3	80.73					
	B	18.41	16.14	30.73	36.78	32.25	0.140	10.010	259.7	258.0	1174.7	189.6	18.96	99.69	0.224	0.708	Baseline Cl Removed (g)	= 0
5	Ta	14.87	13.89		38.80	36.26	0.070	10.012	216.8	459.1	2090.1	290.3	29.03					
	Ba	10.31	9.06	22.95	41.68	36.64	0.138	10.013	32.9	32.1	146.0	13.2	1.32	30.36	0.068	0.776	Total Cl Measured at ti (g)	= 445.7
5	Tb	15.60	14.43		40.59	37.56	0.081	10.011	312.4	631.6	2875.6	414.9	41.49					
	Bb	12.83	11.19	25.62	38.67	33.73	0.146	10.019	27.8	26.7	112.4	12.6	1.26	42.75	0.096	0.872	Added Cl Recovered at ti (g)	= 445.7
6	T	15.25	14.33		37.76	35.49	0.064	10.017	336.7	329.4	1498.6	214.7	21.47					
	B	15.03	13.16	27.49	38.94	34.12	0.141	10.012	29.2	26.6	120.9	15.9	1.59	23.06	0.052	0.924	Cl Recovery Ratio	= 0.938
7	T	15.26	14.23		42.01	39.17	0.072	10.020	220.7	222.4	1011.8	143.9	14.39					
	B	15.29	13.38	27.60	33.42	29.25	0.142	10.011	21.6	12.9	59.0	7.9	0.79	15.18	0.034	0.958	Cl Translocated from Plot (g)	= 216.0
8	T	12.50	11.78		35.80	33.75	0.061	10.018	165.1	173.3	788.4	92.9	9.29					
	B	12.75	11.18	22.96	38.30	33.59	0.140	10.014	21.5	12.7	57.7	6.4	0.64	9.93	0.022	0.980	Cl Not Translocated (g)	= 229.7
9	T	15.07	14.10		38.39	35.94	0.068	10.019	62.2	71.2	324.1	45.7	4.57					
	B	12.33	10.78	24.89	36.31	31.76	0.143	10.014	17.8	4.8	21.9	2.4	0.24	4.81	0.011	0.991	Soil Volume Translocated (m3)	= 0.021
10	T	14.72	13.95		42.20	39.99	0.055	10.012	51.7	59.5	270.9	37.8	3.78					
	B	17.84	15.63	29.58	36.32	31.84	0.141	10.014	16.4	2.4	10.9	1.7	0.17	3.95	0.009	1.000	Soil Mass Translocated (kg)	= 22.5
Totals				262.4										445.71	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 09 91, analysed 06 12 91)																
2 3	1 T	14.44	13.94		37.53	36.25	0.035	10.014	154.5	171.6	780.9	108.9	10.89					
	B	15.95	14.41	28.35	36.24	32.74	0.107	10.014	201.6	974.2	4434.0	638.8	63.88	74.77	0.174	0.174	Bulk Density at to (kg/m3)	= 1088
	2 T	13.90	13.34		48.01	46.08	0.042	10.014	332.3	655.7	2984.4	398.0	39.80					
	B	15.78	14.26	27.59	40.60	36.69	0.107	10.015	251.2	1226.3	5581.2	795.6	79.56	119.36	0.278	0.452	Cl Added to Plot (g)	= 475
	3 T	12.72	12.14		41.36	39.48	0.048	10.019	416.9	871.3	3964.1	481.1	48.11					
	B	15.03	13.48	25.61	35.53	31.87	0.115	10.011	343.0	707.6	3221.8	434.2	43.42	91.53	0.213	0.666	Baseline Cl Removed (g)	= 0
	4 T	15.50	14.67		43.91	41.58	0.056	10.013	155.3	836.9	3809.5	558.9	55.89					
	B	15.87	14.11	28.79	39.17	34.84	0.124	10.018	67.4	80.9	368.0	51.9	5.19	61.09	0.142	0.808	Total Cl Measured at ti (g)	= 429.1
	5 T	13.91	13.23		44.07	41.91	0.051	10.012	235.8	470.7	2143.1	283.4	28.34					
	B	15.74	14.08	27.31	34.36	30.75	0.118	10.013	49.3	58.1	264.4	37.2	3.72	32.07	0.075	0.883	Added Cl Recovered at ti (g)	= 429.1
	6 T	14.35	13.58		47.62	45.07	0.057	10.019	220.4	229.2	1042.8	141.6	14.16					
	B	15.94	14.20	27.78	37.20	33.14	0.122	10.018	25.6	11.1	50.7	7.2	0.72	14.88	0.035	0.917	Cl Recovery Ratio	= 0.903
	7 T	15.79	14.90		46.71	44.10	0.059	10.011	148.3	166.0	756.0	112.7	11.27					
	B	13.70	12.18	27.09	39.04	34.73	0.124	10.007	40.1	43.3	197.0	24.0	2.40	13.67	0.032	0.949	Cl Translocated from Plot (g)	= 194.1
	8 T	15.06	14.36		40.72	38.85	0.048	10.012	115.0	134.4	611.8	87.9	8.79					
	B	11.56	10.30	24.66	35.00	31.20	0.122	10.010	36.8	35.3	160.7	16.6	1.66	10.44	0.024	0.974	Cl Not Translocated (g)	= 235.0
	9 T	13.44	12.88		43.36	41.56	0.043	10.018	74.7	90.2	410.3	52.8	5.28					
	B	15.53	13.85	26.73	36.46	32.52	0.121	10.016	47.0	55.2	251.3	34.8	3.48	8.76	0.020	0.994	Soil Volume Translocated (m3)	= 0.021
	10 T	16.83	16.03		32.90	31.34	0.050	10.013	36.8	34.8	158.4	25.4	2.54					
	B	14.26	12.63	28.66	34.14	30.24	0.129	10.016	16.4	0.0	0.0	0.0	0.00	2.54	0.006	1.000	Soil Mass Translocated (kg)	= 23.1
Totals				272.6										429.11	1.000			
		(extracted 10 91, analysed 05 12 91)																
2 4	1 T	17.76	16.77		35.55	33.59	0.058	10.005	225.5	225.9	1029.1	172.6	17.26					
	B	16.63	15.14	31.92	33.25	30.28	0.098	10.015	145.4	798.2	3632.9	550.0	55.00	72.27	0.184	0.184	Bulk Density at to (kg/m3)	= 1095
	2 T	14.67	14.01		40.74	38.91	0.047	10.012	235.0	476.1	2167.5	303.6	30.36					
	B	15.09	13.68	27.69	33.50	30.37	0.103	10.016	227.8	1121.1	5101.6	697.9	69.79	100.14	0.256	0.440	Cl Added to Plot (g)	= 475
	3 T	15.32	14.48		41.41	39.14	0.058	10.012	391.4	800.3	3643.4	527.5	52.75					
	B	19.71	17.81	32.28	32.84	29.68	0.107	10.015	216.5	442.1	2011.9	358.2	35.82	88.57	0.226	0.666	Baseline Cl Removed (g)	= 0
	4 T	14.04	13.13		35.63	33.33	0.069	10.013	233.8	470.9	2143.4	281.4	28.14					
	B	17.78	16.00	29.13	33.59	30.24	0.111	10.012	49.1	55.6	253.3	40.5	4.05	32.19	0.082	0.748	Total Cl Measured at ti (g)	= 391.7
	5 T	17.16	15.96		36.54	34.01	0.075	10.016	339.6	334.8	1523.7	243.3	24.33					
	B	20.31	18.26	34.22	34.46	30.98	0.112	10.010	24.8	21.2	96.5	17.6	1.76	26.09	0.067	0.815	Added Cl Recovered at ti (g)	= 391.7
	6 T	15.75	14.55		32.73	30.25	0.082	10.016	237.2	236.7	1077.2	156.8	15.68					
	B	12.36	11.17	25.72	37.18	33.60	0.106	10.018	31.3	29.8	135.4	15.1	1.51	17.19	0.044	0.859	Cl Recovery Ratio	= 0.825
	7 T	15.18	14.24		36.93	34.67	0.065	10.017	35.0	35.1	159.7	22.7	2.27					
	B	21.79	19.67	33.92	34.63	31.27	0.107	10.016	305.6	298.2	1357.2	267.0	26.70	28.97	0.074	0.933	Cl Translocated from Plot (g)	= 172.4
	8 T	15.08	14.17		38.93	36.60	0.064	10.018	140.2	150.8	686.3	97.3	9.73					
	B	14.12	12.74	26.91	33.87	30.56	0.108	10.011	22.4	16.3	74.2	9.4	0.94	10.67	0.027	0.960	Cl Not Translocated (g)	= 219.3
	9 T	18.93	17.75		34.42	32.28	0.066	10.013	97.0	109.1	496.7	88.2	8.82					
	B	19.95	17.98	35.73	34.54	31.14	0.109	10.019	18.6	7.4	33.8	6.1	0.61	9.42	0.024	0.984	Soil Volume Translocated (m3)	= 0.025
	10 T	19.76	18.49		37.90	35.47	0.069	10.008	60.6	68.7	312.9	57.9	5.79					
	B	17.45	15.75	34.24	32.07	28.95	0.108	10.017	17.4	5.3	24.3	3.8	0.38	6.17	0.016	1.000	Soil Mass Translocated (kg)	= 27.2
Totals				311.7										391.69	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 09 91, analysed 25 05 92)																
2 5	1 T	13.13	12.56		40.21	38.47	0.045	10.020	109.8	104.8	476.6	59.8	5.98					
	B	11.64	10.77	23.33	35.65	33.01	0.080	10.019	63.1	613.9	2793.0	300.9	30.09	36.07	0.116	0.116	Bulk Density at to (kg/m3)	= 1094
	2 T	13.72	13.11		32.57	31.13	0.046	10.019	319.7	284.2	1293.0	169.5	16.95					
	B	14.55	13.38	26.49	37.48	34.47	0.087	10.013	108.9	1035.7	4714.8	630.8	63.08	80.03	0.257	0.373	Cl Added to Plot (g)	= 475
	3 T	14.16	13.57		36.32	34.83	0.043	10.020	43.5	419.9	1909.9	259.3	25.93					
	B	18.09	16.64	30.22	35.24	32.43	0.087	10.011	57.3	559.5	2547.3	423.9	42.39	68.32	0.220	0.593	Baseline Cl Removed (g)	= 0
	4 T	14.09	13.82		34.78	34.13	0.019	10.008	42.5	407.5	1856.0	256.6	25.66					
	B	14.72	13.59	27.42	30.71	28.37	0.083	10.006	84.5	81.6	371.8	50.5	5.05	30.71	0.099	0.691	Total Cl Measured at ti (g)	= 311.1
	5 T	16.27	15.63		39.62	38.07	0.041	10.018	360.7	320.4	1458.0	227.9	22.79					
	B	15.69	12.67	28.30	39.64	32.03	0.238	10.010	35.3	31.2	142.1	18.0	1.80	24.59	0.079	0.770	Added Cl Recovered at ti (g)	= 311.1
	6 T	17.87	17.01		36.48	34.74	0.050	10.012	312.7	278.0	1265.7	215.4	21.54					
	B	16.63	15.22	32.23	35.83	32.79	0.093	10.008	22.7	17.0	77.4	11.8	1.18	22.71	0.073	0.843	Cl Recovery Ratio	= 0.655
	7 T	16.63	15.99		44.86	43.15	0.039	10.013	252.8	226.7	1031.8	165.0	16.50					
	B	13.30	12.18	28.18	36.81	33.74	0.091	10.016	21.2	13.6	62.0	7.6	0.76	17.26	0.055	0.899	Cl Translocated from Plot (g)	= 116.1
	8 T	16.02	15.36		36.95	35.44	0.042	10.016	191.8	174.2	792.7	121.8	12.18					
	B	14.32	13.15	28.52	34.45	31.66	0.088	10.010	17.1	6.3	28.6	3.8	0.38	12.55	0.040	0.939	Cl Not Translocated (g)	= 195.1
	9 T	17.11	16.14		35.64	33.64	0.059	10.016	121.2	114.9	522.8	84.4	8.44					
	B	17.05	15.59	31.74	35.16	32.16	0.093	10.018	16.9	6.0	27.2	4.2	0.42	8.86	0.028	0.968	Soil Volume Translocated (m3)	= 0.029
	10 T	17.82	16.90		35.57	33.74	0.054	10.015	134.8	126.7	576.8	97.5	9.75					
	B	16.24	14.85	31.75	40.16	36.73	0.093	10.012	15.6	4.3	19.4	2.9	0.29	10.04	0.032	1.000	Soil Mass Translocated (kg)	= 31.5
Totals				288.2										311.15	1.000			
		(extracted 08 91, analysed 17 09 91)																
2 6	1 T	12.53	11.74		34.51	32.34	0.067	10.018	62.8	69.7	317.3	37.2	3.72					
	B	14.48	13.25	24.98	34.06	31.17	0.093	10.019	97.4	646.8	2942.5	389.8	38.98	42.70	0.142	0.142	Bulk Density at to (kg/m3)	= 1118
	2 T	13.60	12.80		34.57	32.55	0.062	10.020	229.2	232.0	1055.3	135.1	13.51					
	B	15.06	13.78	26.59	36.06	33.01	0.092	10.018	152.8	969.0	4408.8	607.7	60.77	74.28	0.247	0.388	Cl Added to Plot (g)	= 475
	3 T	15.11	14.32		35.78	33.92	0.055	10.018	64.7	430.7	1959.7	280.6	28.06					
	B	12.61	11.48	25.80	33.73	30.72	0.098	10.020	78.9	526.2	2393.5	274.8	27.48	55.55	0.184	0.573	Baseline Cl Removed (g)	= 0
	4 T	15.95	15.18		33.58	31.97	0.050	10.019	423.7	417.1	1897.7	288.1	28.81					
	B	15.32	13.94	29.13	32.18	29.30	0.098	10.015	79.5	88.3	402.0	56.1	5.61	34.42	0.114	0.687	Total Cl Measured at ti (g)	= 301.2
	5 T	15.83	14.91		31.81	29.97	0.061	10.016	318.5	319.2	1452.7	216.6	21.66					
	B	13.33	12.14	27.05	33.54	30.56	0.098	10.007	32.5	31.7	144.3	17.5	1.75	23.41	0.078	0.765	Added Cl Recovered at ti (g)	= 301.2
	6 T	14.28	13.60		36.18	34.46	0.050	10.014	284.3	286.3	1303.1	177.2	17.72					
	B	15.70	14.25	27.84	30.89	28.04	0.102	10.013	27.7	25.5	116.2	16.6	1.66	19.37	0.064	0.829	Cl Recovery Ratio	= 0.634
	7 T	16.97	15.99		31.00	29.21	0.061	10.011	169.1	175.8	800.3	127.9	12.79					
	B	18.65	16.94	32.93	33.83	30.74	0.101	10.008	17.2	5.5	25.2	4.3	0.43	13.22	0.044	0.873	Cl Translocated from Plot (g)	= 117.0
	8 T	14.60	13.80		32.13	30.38	0.058	10.019	212.9	215.8	981.9	135.5	13.55					
	B	12.50	11.38	25.19	30.84	28.10	0.098	10.015	16.6	4.5	20.7	2.4	0.24	13.79	0.046	0.919	Cl Not Translocated (g)	= 184.2
	9 T	15.43	14.57		30.72	29.02	0.059	10.012	166.5	173.5	789.6	115.1	11.51					
	B	17.11	15.57	30.15	29.88	27.21	0.098	10.020	15.2	2.1	9.4	1.5	0.15	11.65	0.039	0.957	Soil Volume Translocated (m3)	= 0.029
	10 T	14.83	13.98		38.74	36.53	0.061	10.020	196.6	199.7	908.2	126.9	12.69					
	B	12.73	11.60	25.57	33.22	30.28	0.097	10.017	15.3	2.3	10.5	1.2	0.12	12.82	0.043	1.000	Soil Mass Translocated (kg)	= 32.9
Totals				275.2										301.21	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
2 7	1 T	13.33	12.46		37.66	35.21	0.070	10.007	48.1	112.0	510.0	63.5	6.35					
	B	16.45	14.91	27.37	40.66	36.87	0.103	10.016	101.2	112.9	513.9	76.6	7.66	14.02	0.062	0.062	Bulk Density at to (kg/m3)	= 1133
	2 T	14.53	13.56		37.81	35.30	0.071	10.020	282.9	278.6	1267.3	171.8	17.18					
	B	14.33	12.95	26.51	38.42	34.73	0.106	10.018	161.1	873.5	3974.4	514.7	51.47	68.65	0.306	0.369	Cl Added to Plot (g)	= 475
	3 T	16.01	15.11		38.07	35.93	0.060	10.018	261.5	259.6	1181.1	178.4	17.84					
	B	14.05	12.68	27.78	35.03	31.63	0.108	10.013	241.1	241.2	1097.8	139.2	13.92	31.76	0.142	0.510	Baseline Cl Removed (g)	= 2.74
	3 T	13.82	13.09		37.33	35.37	0.056	10.019	285.4	280.8	1277.4	167.2	16.72					
	B	13.28	11.91	24.99	39.87	35.75	0.115	10.017	243.1	243.0	1105.7	131.6	13.16	29.88	0.133	0.643	Total Cl Measured at ti (g)	= 224.3
	4 T	14.40	12.94		35.76	32.14	0.113	10.012	326.9	320.9	1460.9	189.0	18.90					
	B	14.43	13.31	26.25	38.65	35.65	0.084	10.018	100.4	112.1	510.1	67.9	6.79	25.69	0.115	0.758	Added Cl Recovered at ti (g)	= 224.3
	6 T	12.71	11.91		38.05	35.66	0.067	10.010	245.5	245.2	1116.4	132.9	13.29					
	B	12.41	11.21	23.11	37.26	33.65	0.107	10.010	43.4	50.2	228.5	25.6	2.56	15.85	0.071	0.829	Cl Recovery Ratio	= 0.475
	7 T	13.71	12.92		35.53	33.49	0.061	10.015	191.6	195.8	891.3	115.1	11.51					
	B	11.79	10.63	23.54	40.16	36.21	0.109	10.010	27.8	24.7	112.5	12.0	1.20	12.71	0.057	0.885	Cl Translocated from Plot (g)	= 82.7
	8 T	13.11	12.27		41.71	39.05	0.068	10.017	140.5	151.1	687.3	84.3	8.43					
	B	15.87	14.29	26.56	36.37	32.75	0.110	10.018	25.2	21.2	96.5	13.8	1.38	9.81	0.044	0.929	Cl Not Translocated (g)	= 141.6
	9 T	14.23	13.19		38.87	36.03	0.079	10.017	131.0	142.1	646.7	85.3	8.53					
	B	15.59	13.97	27.16	37.04	33.20	0.116	10.014	21.2	11.8	53.7	7.5	0.75	9.28	0.041	0.970	Soil Volume Translocated (m3)	= 0.031
	10 T	12.42	11.34		35.29	32.25	0.094	10.019	103.3	115.1	523.4	59.4	5.94					
	B	12.17	10.86	22.20	35.97	32.11	0.120	10.015	22.3	14.6	66.5	7.2	0.72	6.66	0.030	1.000	Soil Mass Translocated (kg)	= 34.9
Totals				255.5										224.31	1.000			
		(extracted 10 91, analysed 05 12 91)																
2 8	1 T	15.24	14.26		38.92	36.42	0.069	10.017	137.2	148.0	673.3	96.0	9.60					
	B	14.46	12.99	27.24	34.93	31.39	0.113	10.019	418.5	422.7	1922.9	249.7	24.97	34.57	0.118	0.118	Bulk Density at to (kg/m3)	= 1112
	2 T	15.14	14.19		37.25	34.93	0.066	10.013	297.0	290.9	1324.3	187.9	18.79					
	B	12.72	11.54	25.73	35.90	32.58	0.102	10.011	195.0	973.1	4430.3	511.2	51.12	69.91	0.239	0.357	Cl Added to Plot (g)	= 475
	3 T	19.30	17.86		39.44	36.50	0.081	10.018	410.0	413.0	1879.1	335.5	33.55					
	B	16.29	14.67	32.53	37.61	33.89	0.110	10.017	240.2	475.7	2164.6	317.6	31.76	65.31	0.223	0.580	Baseline Cl Removed (g)	= 2.85
	4 T	16.61	15.59		37.43	35.14	0.065	10.016	106.7	118.5	539.1	84.0	8.40					
	B	12.88	11.60	27.18	34.49	31.07	0.110	10.011	244.9	244.6	1113.8	129.1	12.91	21.32	0.073	0.652	Total Cl Measured at ti (g)	= 293.0
	5 T	16.75	15.68		40.94	38.33	0.068	10.009	211.6	214.0	974.4	152.8	15.28					
	B	12.60	11.31	26.99	32.49	29.18	0.114	10.018	54.6	62.7	285.4	32.3	3.23	18.50	0.063	0.715	Added Cl Recovered at ti (g)	= 293.0
	6 T	17.06	16.01		35.12	32.97	0.065	10.012	255.0	253.8	1155.2	184.9	18.49					
	B	16.54	14.88	30.89	38.58	34.72	0.111	10.020	38.9	42.1	191.4	28.5	2.85	21.34	0.073	0.788	Cl Recovery Ratio	= 0.621
	7 T	18.05	16.98		32.92	30.97	0.063	10.017	213.0	215.3	979.6	166.3	16.63					
	B	15.61	14.02	31.00	35.76	32.12	0.113	10.014	32.2	31.0	141.2	19.8	1.98	18.61	0.064	0.852	Cl Translocated from Plot (g)	= 104.5
	8 T	14.37	13.54		38.78	36.56	0.061	10.019	217.5	219.5	998.4	135.2	13.52					
	B	12.05	10.81	24.35	35.25	31.63	0.114	10.013	31.8	30.4	138.4	15.0	1.50	15.02	0.051	0.903	Cl Not Translocated (g)	= 188.5
	9 T	17.01	15.89		36.56	34.17	0.070	10.015	181.2	187.2	851.8	135.4	13.54					
	B	12.43	11.13	27.02	37.78	33.84	0.116	10.009	25.6	21.7	98.9	11.0	1.10	14.64	0.050	0.953	Soil Volume Translocated (m3)	= 0.032
	10 T	13.73	12.93		35.31	33.27	0.061	10.015	221.0	222.7	1013.6	131.1	13.11					
	B	16.02	14.32	27.26	37.24	33.31	0.118	10.020	20.3	9.7	44.3	6.3	0.63	13.75	0.047	1.000	Soil Mass Translocated (kg)	= 36.1
Totals				280.2										292.97	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
2 9	1 T	15.80	15.07		45.27	43.21	0.048	10.012	74.9	89.8	408.8	61.6	6.16					
	B	15.38	13.76	28.83	38.75	34.68	0.117	10.019	368.4	713.1	3244.3	446.4	44.64	50.81	0.159	0.159	Bulk Density at to (kg/m3)	= 1075
	2 T	13.44	12.69		44.18	41.73	0.059	10.012	235.3	468.6	2133.2	270.7	27.07					
	B	12.15	10.93	23.62	40.94	36.86	0.111	10.015	215.7	1077.6	4904.5	536.2	53.62	80.69	0.252	0.410	Cl Added to Plot (g)	= 475
	3 T	16.21	15.34		43.35	41.03	0.056	10.017	213.3	439.3	1998.8	306.6	30.66					
	B	16.54	14.71	30.05	40.44	35.98	0.124	10.020	289.7	558.6	2541.0	373.8	37.38	68.04	0.212	0.623	Baseline Cl Removed (g)	= 4.47
	4 T	17.29	16.09		39.86	37.09	0.074	10.009	414.4	417.6	1901.7	306.0	30.60					
	B	15.26	13.52	29.61	37.29	33.04	0.129	10.004	49.2	57.8	263.4	35.6	3.56	34.16	0.107	0.729	Total Cl Measured at ti (g)	= 320.4
	5 T	17.52	16.29		44.35	41.24	0.075	10.015	259.2	259.4	1180.7	192.3	19.23					
	B	14.37	12.67	28.95	39.76	35.06	0.134	10.013	30.8	26.2	119.1	15.1	1.51	20.74	0.065	0.794	Added Cl Recovered at ti (g)	= 320.4
	6 T	17.62	16.16		33.71	30.93	0.090	10.016	193.1	201.8	918.5	148.4	14.84					
	B	13.20	11.70	27.87	32.53	28.85	0.127	10.008	25.3	14.9	67.6	7.9	0.79	15.64	0.049	0.843	Cl Recovery Ratio	= 0.681
	7 T	15.12	13.83		39.43	36.07	0.093	10.011	192.0	200.8	914.4	126.4	12.64					
	B	12.69	11.20	25.03	37.15	32.81	0.132	10.014	23.2	8.8	40.1	4.5	0.45	13.09	0.041	0.884	Cl Translocated from Plot (g)	= 131.5
	8 T	15.80	14.39		38.76	35.30	0.098	10.015	115.4	133.6	608.0	87.5	8.75					
	B	14.59	12.85	27.24	33.06	29.12	0.135	10.022	22.5	7.0	31.9	4.1	0.41	9.16	0.029	0.912	Cl Not Translocated (g)	= 188.9
	9 T	15.94	14.61		33.48	30.71	0.090	10.020	292.9	286.5	1303.4	190.5	19.05					
	B	16.11	14.15	28.76	34.29	30.13	0.138	10.018	22.1	6.1	27.6	3.9	0.39	19.44	0.061	0.973	Soil Volume Translocated (m3)	= 0.028
	10 T	14.32	12.98		31.44	28.52	0.102	10.020	123.1	141.1	641.9	83.4	8.34					
	B	15.81	13.92	26.91	29.92	26.35	0.135	10.022	21.6	4.8	21.9	3.0	0.30	8.64	0.027	1.000	Soil Mass Translocated (kg)	= 29.7
Totals				276.9										320.40	1.000			
		(extracted 10 91, analysed 05 12 91)																
2 10	1 T	15.28	14.16		44.43	41.17	0.079	10.005	137.1	154.3	703.2	99.5	9.95					
	B	14.01	12.41	26.57	32.52	28.82	0.128	10.001	174.5	921.9	4201.5	521.5	52.15	62.10	0.166	0.166	Bulk Density at to (kg/m3)	= 1080
	2 T	17.87	16.25		36.06	32.80	0.099	10.010	316.1	611.4	2784.1	452.5	45.25					
	B	18.37	16.25	32.50	41.24	36.49	0.130	10.009	270.1	1262.6	5749.7	934.2	93.42	138.67	0.370	0.535	Cl Added to Plot (g)	= 475
	3 T	17.18	15.54		38.13	34.51	0.105	10.010	323.3	601.4	2738.4	425.6	42.56					
	B	13.91	12.19	27.73	34.23	30.01	0.141	10.013	375.2	372.3	1694.6	206.6	20.66	63.22	0.169	0.704	Baseline Cl Removed (g)	= 4.17
	4 T	17.11	15.47		42.61	38.54	0.106	10.014	408.8	411.1	1871.0	289.5	28.95					
	B	17.15	14.99	30.46	39.46	34.51	0.143	10.012	59.7	70.7	322.1	48.3	4.83	33.77	0.090	0.794	Total Cl Measured at ti (g)	= 375.1
	5 T	17.12	15.68		39.10	35.82	0.092	10.020	214.0	220.7	1003.8	157.4	15.74					
	B	16.79	14.60	30.28	36.17	31.46	0.150	10.018	24.1	11.1	50.7	7.4	0.74	16.48	0.044	0.838	Added Cl Recovered at ti (g)	= 375.1
	6 T	16.63	15.40		39.79	36.85	0.080	10.008	240.1	243.4	1108.5	170.7	17.07					
	B	11.01	9.58	24.97	39.74	34.58	0.149	10.012	25.8	16.4	74.6	7.1	0.71	17.78	0.047	0.885	Cl Recovery Ratio	= 0.797
	7 T	16.08	14.65		42.17	38.43	0.097	10.020	196.8	205.2	933.5	136.7	13.67					
	B	16.16	14.13	28.78	40.76	35.65	0.143	10.011	27.9	0.0	0.0	0.0	0.00	13.67	0.036	0.922	Cl Translocated from Plot (g)	= 200.8
	8 T	17.77	16.07		37.16	33.62	0.105	10.010	130.3	148.0	673.9	108.3	10.83					
	B	14.82	12.90	28.98	44.72	38.95	0.148	10.015	23.1	8.6	38.9	5.0	0.50	11.33	0.030	0.952	Cl Not Translocated (g)	= 174.4
	9 T	14.32	13.02		40.98	37.28	0.099	10.020	131.4	149.0	677.9	88.3	8.83					
	B	16.14	14.02	27.04	39.03	33.93	0.151	10.011	23.6	9.9	44.9	6.3	0.63	9.46	0.025	0.977	Soil Volume Translocated (m3)	= 0.021
	10 T	17.18	15.66		38.17	34.80	0.097	10.010	96.5	114.3	520.7	81.5	8.15					
	B	14.37	12.43	28.09	38.37	33.21	0.155	10.020	23.2	8.8	39.9	5.0	0.50	8.65	0.023	1.000	Soil Mass Translocated (kg)	= 22.5
Totals				285.4										375.14	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
2 11	1 T	16.73	15.52		34.73	32.23	0.078	10.017	172.5	165.6	753.5	116.9	11.69					
	B	12.80	11.53	27.05	31.70	28.56	0.110	10.018	185.9	878.4	3996.7	460.8	46.08	57.77	0.198	0.198	Bulk Density at to (kg/m3)	= 1069
	2 T	15.44	14.48		38.64	36.24	0.066	10.012	255.4	233.1	1061.2	153.6	15.36					
	B	13.88	12.52	27.00	33.56	30.28	0.108	10.010	269.7	1200.7	5467.2	684.6	68.46	83.82	0.287	0.287	Cl Added to Plot (g)	= 475
	3 T	16.17	14.94		35.63	32.94	0.082	10.017	239.6	220.7	1004.2	150.0	15.00					
	B	15.92	14.40	29.34	28.84	26.09	0.105	10.016	336.9	298.1	1356.7	195.3	19.53	34.54	0.118	0.603	Baseline Cl Removed (g)	= 0
	4 T	15.99	14.96		37.50	35.10	0.068	10.010	181.8	173.3	789.0	118.0	11.80					
	B	13.15	11.78	26.74	32.12	28.78	0.116	10.016	46.4	45.7	208.0	24.5	2.45	14.25	0.049	0.652	Total Cl Measured at ti (g)	= 291.9
	5 T	19.19	17.63		27.88	25.62	0.088	10.020	207.7	194.8	886.3	156.3	15.63					
	B	12.75	11.39	29.02	33.43	29.87	0.119	10.009	30.7	22.9	104.2	11.9	1.19	16.81	0.058	0.710	Added Cl Recovered at ti (g)	= 291.9
	6 T	18.22	16.82		32.61	30.11	0.083	10.009	319.2	283.0	1288.6	216.8	21.68					
	B	15.62	14.00	30.82	34.55	32.76	0.116	10.012	26.5	18.0	81.9	11.5	1.15	22.82	0.078	0.788	Cl Recovery Ratio	= 0.615
	7 T	17.20	15.80		39.34	36.17	0.088	10.007	324.7	287.7	1310.4	207.1	20.71					
	B	15.95	14.26	30.07	34.05	32.29	0.116	10.013	30.1	22.2	100.9	14.4	1.44	22.15	0.076	0.864	Cl Translocated from Plot (g)	= 141.6
	8 T	17.26	15.87		35.02	32.20	0.088	10.011	276.0	248.9	1133.1	179.8	17.98					
	B	16.10	14.38	30.25	29.38	26.25	0.119	10.016	24.47	13.1	59.7	8.6	0.86	18.84	0.065	0.928	Cl Not Translocated (g)	= 150.3
	9 T	17.45	15.95		36.94	33.76	0.094	10.020	125.5	124.8	567.8	90.5	9.05					
	B	13.34	11.94	27.88	28.55	25.55	0.117	10.016	20.88	5.7	25.8	3.1	0.31	9.36	0.032	0.960	Soil Volume Translocated (m3)	= 0.031
	10 T	16.47	15.20		39.20	36.17	0.084	10.018	170.4	163.8	745.4	113.3	11.33					
	B	16.51	14.84	30.04	30.80	27.70	0.112	10.016	19.35	3.1	14.0	2.1	0.21	11.53	0.040	1.000	Soil Mass Translocated (kg)	= 33.3
Totals				288.2										291.90	1.000			
		(extracted 08 91, analysed 24 09 91)																
2 12	1 T	14.16	13.50		31.90	30.42	0.049	10.018	261.3	265.4	1207.5	163.0	16.30					
	B	12.11	11.22	24.72	35.29	32.71	0.079	10.015	409.5	404.7	1841.9	206.7	20.67	36.96	0.149	0.149	Bulk Density at to (kg/m3)	= 1067
	2 T	16.85	15.99		41.28	39.19	0.053	10.006	20.3	5.8	26.2	4.2	0.42					
	B	14.64	13.93	29.92	37.76	35.95	0.050	10.016	167.1	1086.5	4944.4	688.9	68.89	69.31	0.280	0.429	Cl Added to Plot (g)	= 475
	3 T	15.01	14.20		30.82	29.17	0.056	10.017	272.1	274.3	1248.1	177.3	17.73					
	B	11.72	10.78	24.99	38.43	35.37	0.086	10.013	420.9	416.1	1894.2	204.2	20.42	38.15	0.154	0.583	Baseline Cl Removed (g)	= 0
	4 T	15.90	14.96		37.90	35.66	0.063	10.020	366.8	362.0	1646.9	246.3	24.63					
	B	16.60	15.32	30.28	37.38	34.51	0.083	10.013	129.8	144.5	657.6	100.7	10.07	34.71	0.140	0.724	Total Cl Measured at ti (g)	= 247.5
	5 T.	15.29	14.38		30.75	28.93	0.063	10.009	201.5	213.1	970.6	139.6	13.96					
	B	14.49	13.35	27.74	34.30	31.62	0.085	10.015	26.0	20.2	92.1	12.3	1.23	15.19	0.061	0.785	Added Cl Recovered at ti (g)	= 247.5
	6 T	15.82	14.95		37.12	35.09	0.058	10.020	190.4	202.9	922.9	138.0	13.80					
	B	13.92	12.76	27.71	35.55	32.59	0.091	10.012	21.9	9.3	42.5	5.4	0.54	14.34	0.058	0.843	Cl Recovery Ratio	= 0.521
	7 T	16.39	15.50		38.60	36.51	0.057	10.016	127.3	141.9	645.9	100.1	10.01					
	B	13.50	12.47	27.97	36.92	34.13	0.082	10.010	24.6	16.3	74.2	9.3	0.93	10.94	0.044	0.887	Cl Translocated from Plot (g)	= 106.3
	8 T	16.82	15.96		34.17	32.44	0.053	10.015	155.2	169.6	772.1	123.2	12.32					
	B	16.45	15.22	31.19	32.81	30.37	0.080	10.009	22.3	10.4	47.4	7.2	0.72	13.05	0.053	0.940	Cl Not Translocated (g)	= 141.3
	9 T	16.69	15.79		35.08	33.20	0.057	10.013	97.6	111.1	505.7	79.8	7.98					
	B	13.33	12.26	28.04	33.01	30.36	0.087	10.013	22.9	11.8	53.9	6.6	0.66	8.64	0.035	0.975	Soil Volume Translocated (m3)	= 0.027
	10 T	19.52	18.49		37.70	35.72	0.055	10.012	62.2	69.7	317.5	58.7	5.87					
	B	15.29	13.97	32.45	37.41	34.18	0.095	10.012	20.4	5.9	26.8	3.7	0.37	6.24	0.025	1.000	Soil Mass Translocated (kg)	= 28.4
Totals				285.0										247.53	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (Tandem Disc - N to S)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot
		(extracted 10 91, analysed 12 91)															
2 11	1 B	12.80	11.53		31.70	28.56	0.110	10.018	162.0	875.0	3981.3						
	2 B	13.88	12.52		33.56	30.28	0.108	10.010	246.0	1217.4	5543.5						
		(extracted 10 91, analysed 12 91)															
2 5	1 B	11.64	10.77		35.65	33.01	0.080	10.019	274.4	604.1	2748.2						
	2 B	14.55	13.38		37.48	34.47	0.087	10.013	207.4	1070.0	4870.5						
	3 T	14.16	13.57		36.32	34.83	0.043	10.020	207.2	416.7	1895.5						
	B	18.09	16.64		35.24	32.43	0.087	10.011	305.1	591.1	2691.2						
	4 T	14.09	13.82		34.78	34.13	0.019	10.008	208.2	422.4	1923.9						

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 08 91, analysed 17 09 91)																
3 1 1	T	18.20	16.55		32.94	29.96	0.099	10.008	247.6	249.3	1135.4	187.9	18.79					
	B	16.95	15.09	31.64	30.02	26.74	0.123	10.020	406.9	804.3	3658.8	552.2	55.22	74.01	0.183	0.183	Bulk Density at to (kg/m3)	= 1123
2	T	18.26	16.35		36.68	32.85	0.116	10.014	173.9	180.5	821.6	134.4	13.44					
	B	21.98	19.23	35.59	29.79	26.08	0.143	10.019	228.1	1392.9	6336.6	1218.8	121.88	135.31	0.334	0.516	Cl Added to Plot (g)	= 475
3	T	19.62	17.37		28.85	25.55	0.129	10.020	291.5	290.8	1322.7	229.8	22.98					
	B	16.21	14.11	31.48	29.40	25.59	0.149	10.015	248.7	250.4	1139.4	160.8	16.08	39.05	0.096	0.612	Baseline Cl Recovered (g)	= 0
4	T	17.51	15.45		35.15	31.02	0.133	10.018	120.6	130.9	595.8	92.1	9.21					
	B	15.68	13.16	28.62	36.97	31.05	0.191	10.014	19.6	11.6	52.9	7.0	0.70	9.90	0.024	0.637	Total Cl Measured at ti (g)	= 405.5
5	T	16.43	14.70		33.89	30.33	0.117	10.013	317.7	316.1	1438.7	211.5	21.15					
	B	16.03	13.87	28.57	35.42	30.65	0.156	10.012	21.6	16.5	75.0	10.4	1.04	22.19	0.055	0.692	Added Cl Recovered at ti (g)	= 405.5
6	T	17.84	15.96		33.26	29.76	0.117	10.018	297.0	295.9	1346.3	214.9	21.49					
	B	16.14	13.88	29.85	34.99	30.11	0.162	10.015	21.1	15.2	69.0	9.6	0.96	22.45	0.055	0.747	Cl Recovery Ratio	= 0.854
7	T	18.40	16.63		31.79	28.75	0.106	10.015	321.7	320.0	1456.3	242.2	24.22					
	B	15.23	13.14	29.78	36.16	31.21	0.158	10.011	29.2	27.3	124.4	16.4	1.64	25.86	0.064	0.811	Cl Translocated from Plot (g)	= 196.2
8	T	15.43	13.81		35.02	31.36	0.117	10.020	406.8	403.7	1836.3	253.7	25.37					
	B	15.55	13.38	27.19	34.59	29.77	0.162	10.013	55.1	61.0	277.7	37.1	3.71	29.08	0.072	0.882	Cl Not Translocated (g)	= 209.3
9	T	19.38	17.18		35.80	31.75	0.128	10.006	382.1	379.4	1728.4	297.0	29.70					
	B	17.98	15.50	32.68	32.01	27.61	0.160	10.016	24.4	21.7	98.7	15.3	1.53	31.23	0.077	0.959	Soil Volume Translocated (m3)	= 0.030
10	T	19.33	17.36		32.84	29.50	0.113	10.012	198.1	201.6	917.6	159.3	15.93					
	B	18.16	15.57	32.93	40.17	34.45	0.166	10.006	17.7	7.5	34.2	5.3	0.53	16.46	0.041	1.000	Soil Mass Translocated (kg)	= 34.2
Totals				308.3										405.55	1.000			
		(extracted 10 91, analysed 05 12 91)																
3 2 1	T	15.73	14.00		34.41	30.63	0.123	10.010	59.6	70.6	321.4	45.0	4.50					
	B	11.14	9.61	23.61	40.05	34.56	0.159	10.020	272.1	270.0	1228.1	118.0	11.80	16.30	0.067	0.067	Bulk Density at to (kg/m3)	= 1143
2	T	16.82	14.89		35.23	31.19	0.130	10.005	252.7	254.0	1157.2	172.3	17.23					
	B	14.03	12.23	27.12	35.83	31.26	0.146	10.012	190.0	982.5	4472.9	547.2	54.72	71.95	0.297	0.364	Cl Added to Plot (g)	= 475
3	T	16.74	14.76		34.77	30.66	0.134	10.014	329.7	321.2	1461.9	215.7	21.57					
	B	15.11	13.12	27.88	35.01	30.42	0.151	10.008	355.5	693.3	3157.6	414.4	41.44	63.01	0.260	0.624	Baseline Cl Recovered (g)	= 0
4	T	13.22	11.74		38.28	33.99	0.126	10.006	72.1	86.2	392.7	46.1	4.61					
	B	12.61	10.84	22.58	43.05	37.03	0.163	10.016	29.9	24.5	111.6	12.1	1.21	5.82	0.024	0.648	Total Cl Measured at ti (g)	= 242.4
5	T	14.38	12.74		36.89	32.68	0.129	10.009	132.0	149.6	681.2	86.8	8.68					
	B	17.41	14.97	27.71	41.49	35.68	0.163	10.020	29.0	23.2	105.7	15.8	1.58	10.26	0.042	0.690	Added Cl Recovered at ti (g)	= 242.4
6	T	12.88	11.43		37.15	32.99	0.126	10.019	151.3	167.2	760.6	87.0	8.70					
	B	13.20	11.35	22.78	36.14	31.09	0.162	10.011	33.7	31.2	142.0	16.1	1.61	10.31	0.043	0.733	Cl Recovery Ratio	= 0.510
7	T	16.13	14.38		34.94	31.17	0.121	10.008	187.9	197.5	899.6	129.4	12.94					
	B	13.89	11.95	26.33	39.85	34.30	0.162	10.009	31.4	25.0	114.0	13.6	1.36	14.30	0.059	0.792	Cl Translocated from Plot (g)	= 88.2
8	T	12.18	10.95		42.11	37.86	0.112	10.020	306.2	296.8	1350.1	147.8	14.78					
	B	10.49	9.06	20.00	44.60	38.52	0.158	10.020	50.0	58.9	267.7	24.2	2.42	17.20	0.071	0.863	Cl Not Translocated (g)	= 154.2
9	T	14.61	13.13		41.51	37.31	0.112	10.011	244.6	247.2	1125.5	147.8	14.78					
	B	13.62	11.71	24.84	43.12	37.08	0.163	10.016	42.8	50.0	227.8	26.7	2.67	17.44	0.072	0.935	Soil Volume Translocated (m3)	= 0.035
10	T	13.20	11.43		34.96	30.28	0.155	10.020	291.4	285.4	1298.0	148.4	14.84					
	B	12.66	11.61	23.04	41.68	38.26	0.090	10.016	26.4	18.3	83.5	9.7	0.97	15.81	0.065	1.000	Soil Mass Translocated (kg)	= 39.8
Totals				245.9										242.40	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 09 91, analysed 17 09 91)																
3 3 1	T	17.59	15.85		32.79	29.55	0.110	10.014	307.2	307.2	1398.4	221.6	22.16					
	B	13.82	12.11	27.96	38.50	33.76	0.140	10.017	228.6	1395.7	6350.6	769.3	76.93	99.09	0.243	0.243	Bulk Density at to (kg/m3)	= 1153
2	T	15.07	13.56		34.28	30.86	0.111	10.006	215.8	1323.7	6029.7	817.7	81.77					
	B	14.08	12.37	25.93	37.65	33.09	0.138	10.010	244.1	1481.8	6747.4	834.7	83.47	165.25	0.405	0.648	Cl Added to Plot (g)	= 475
3	T	18.26	16.30		31.33	27.97	0.120	10.014	277.2	278.8	1269.0	206.8	20.68					
	B	16.88	14.64	30.94	36.93	32.05	0.152	10.013	191.2	196.2	893.3	130.8	13.08	33.76	0.083	0.730	Baseline Cl Recovered (g)	= 6.19
4	T	16.79	14.94		33.78	30.08	0.123	10.008	163.2	171.1	779.3	116.4	11.64					
	B	16.02	13.78	28.72	35.52	30.56	0.162	10.019	20.2	12.0	54.5	7.5	0.75	12.40	0.030	0.761	Total Cl Measured at ti (g)	= 408.1
5	T	15.23	13.57		34.75	30.97	0.122	10.019	201.7	206.1	937.5	127.2	12.72					
	B	19.48	16.74	30.31	38.93	33.47	0.163	10.019	28.2	25.4	115.7	19.4	1.94	14.66	0.036	0.797	Added Cl Recovered at ti (g)	= 408.1
6	T	14.29	12.75		38.39	34.25	0.121	10.012	266.4	268.5	1222.5	155.8	15.58					
	B	11.14	9.60	22.34	38.15	32.88	0.160	10.015	40.8	43.1	196.0	18.8	1.88	17.46	0.043	0.839	Cl Recovery Ratio	= 0.871
7	T	15.25	13.54		32.46	28.82	0.126	10.004	260.5	262.9	1197.9	162.1	16.21					
	B	13.69	11.80	25.34	35.81	30.89	0.159	10.015	49.7	55.0	250.1	29.5	2.95	19.17	0.047	0.886	Cl Translocated from Plot (g)	= 264.3
8	T	11.79	10.50		33.01	29.40	0.123	10.011	274.1	275.9	1256.0	131.8	13.18					
	B	10.64	9.18	19.67	36.71	31.68	0.159	10.020	36.9	37.1	169.0	15.5	1.55	14.73	0.036	0.923	Cl Not Translocated (g)	= 143.8
9	T	11.38	10.16		34.68	30.97	0.120	10.008	289.1	290.0	1320.9	134.2	13.42					
	B	10.36	8.70	18.86	36.95	31.05	0.190	10.019	37.3	37.8	172.0	15.0	1.50	14.91	0.037	0.959	Soil Volume Translocated (m3)	= 0.021
10	T	13.20	12.00		34.05	30.96	0.100	10.013	245.9	248.9	1133.2	135.9	13.59					
	B	12.20	10.64	22.64	28.29	24.68	0.146	10.010	58.2	64.4	293.3	31.2	3.12	16.72	0.041	1.000	Soil Mass Translocated (kg)	= 23.9
Totals				252.7										408.15	1.000			
		(extracted 10 91, analysed 03 06 92)																
3 4 1	T	17.18	15.97		39.03	36.29	0.075	10.009	383.5	337.4	1536.7	245.4	24.54					
	B	20.06	18.08	34.05	37.58	33.87	0.109	10.023	187.5	889.2	4043.5	731.0	73.10	97.64	0.266	0.266	Bulk Density at to (kg/m3)	= 1163
2	T	14.86	13.71		35.35	32.62	0.084	10.017	122.5	608.0	2766.6	379.2	37.92					
	B	12.40	11.18	24.89	39.93	36.03	0.108	10.012	257.1	1163.5	5296.9	592.4	59.24	97.16	0.264	0.530	Cl Added to Plot (g)	= 475
3	T	14.65	13.55		31.16	28.83	0.081	10.010	95.5	482.9	2198.7	297.9	29.79					
	B	14.65	13.17	26.72	36.59	32.91	0.112	10.020	102.4	515.2	2343.8	308.7	30.87	60.66	0.165	0.695	Baseline Cl Recovered (g)	= 0
4	T	16.38	14.86		31.62	28.68	0.102	10.017	74.8	376.5	1713.2	256.5	25.45					
	B	19.56	17.44	32.29	35.02	31.23	0.121	10.008	31.0	22.4	102.2	17.8	1.78	27.23	0.074	0.769	Total Cl Measured at ti (g)	= 367.5
5	T	14.67	13.34		34.76	31.63	0.099	10.019	417.0	364.4	1657.9	221.2	22.12					
	B	16.06	14.34	27.68	33.95	30.33	0.120	10.016	22.9	7.6	34.4	4.9	0.49	22.62	0.062	0.831	Added Cl Recovered at ti (g)	= 367.5
6	T	15.96	14.64		29.71	27.27	0.089	10.014	265.4	241.7	1100.0	161.1	16.11					
	B	15.42	13.79	28.43	29.58	26.45	0.118	10.019	24.4	11.0	49.8	6.9	0.69	16.80	0.046	0.876	Cl Recovery Ratio	= 0.774
7	T	15.79	14.13		32.74	29.30	0.117	10.015	198.2	186.6	849.3	120.0	12.00					
	B	14.07	12.92	27.04	32.47	29.81	0.089	10.014	25.2	12.7	57.7	7.4	0.74	12.74	0.035	0.911	Cl Translocated from Plot (g)	= 194.8
8	T	14.66	13.59		28.83	26.73	0.079	10.017	206.8	193.9	882.2	119.9	11.99					
	B	13.95	12.47	26.06	35.61	31.85	0.118	10.017	22.9	7.6	34.6	4.3	0.43	12.42	0.034	0.945	Cl Not Translocated (g)	= 172.7
9	T	16.28	14.93		31.74	29.11	0.090	10.013	115.2	115.5	525.7	78.5	7.85					
	B	16.83	15.04	29.97	33.91	30.32	0.119	10.013	27.1	17.6	80.3	12.1	1.21	9.05	0.025	0.970	Soil Volume Translocated (m3)	= 0.022
10	T	16.10	14.89		33.88	31.34	0.081	10.014	159.6	154.5	703.4	104.7	10.47					
	B	15.03	13.37	28.25	35.52	31.60	0.124	10.018	24.7	11.5	52.5	7.0	0.70	11.17	0.030	1.000	Soil Mass Translocated (kg)	= 25.6
Totals				285.4										367.50	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
(extracted 10 91, analysed 03 06 92)																	
3 5 1 T	15.23	13.84		39.63	36.04	0.100	10.006	341.1	302.7	1379.0	190.9	19.09					
B	22.02	19.70	33.54	34.87	31.20	0.117	10.011	149.0	726.1	3305.9	651.3	65.13	84.22	0.249	0.249	Bulk Density at to (kg/m3)	= 1161
2 T	16.06	14.52		33.41	30.21	0.106	10.015	106.9	536.3	2440.6	354.3	35.43					
B	15.19	13.56	28.07	30.59	27.31	0.120	10.016	250.3	1138.0	5178.8	702.2	70.22	105.64	0.312	0.561	Cl Added to Plot (g)	= 475
3 T	17.85	16.28		38.18	34.84	0.096	10.015	69.4	348.1	1584.4	258.0	25.80					
B	16.77	14.93	31.21	40.95	36.47	0.123	10.015	331.9	295.1	1343.1	200.5	20.05	45.85	0.136	0.697	Baseline Cl Recovered (g)	= 4.51
4 T	17.73	16.18		36.06	32.92	0.095	10.018	275.6	249.7	1135.9	183.8	18.38					
B	16.94	15.00	31.19	42.45	37.61	0.129	10.020	33.7	26.2	119.0	17.8	1.78	20.17	0.060	0.756	Total Cl Measured at ti (g)	= 338.3
5 T	14.18	12.98		36.35	33.28	0.092	10.019	351.7	311.5	1417.0	183.9	18.39					
B	10.94	9.69	22.67	39.32	34.85	0.128	10.013	31.4	23.0	104.8	10.2	1.02	19.40	0.057	0.814	Added Cl Recovered at ti (g)	= 338.3
6 T	17.13	15.67		33.99	31.10	0.093	10.022	231.8	214.7	976.2	153.0	15.30					
B	16.35	14.47	30.14	37.27	33.00	0.129	10.022	26.0	14.8	67.2	9.7	0.97	16.27	0.048	0.862	Cl Recovery Ratio	= 0.719
7 T	15.23	14.05		32.48	29.97	0.084	10.007	256.0	234.2	1066.8	149.9	14.99					
B	14.92	13.24	27.28	39.00	34.61	0.127	10.017	23.7	9.2	41.9	5.5	0.55	15.54	0.046	0.908	Cl Translocated from Plot (g)	= 189.9
8 T	17.30	15.82		29.68	27.14	0.094	10.016	198.3	186.7	849.6	134.4	13.44					
B	17.25	15.24	31.06	35.85	31.68	0.132	10.016	23.8	9.6	43.5	6.6	0.66	14.10	0.042	0.949	Cl Not Translocated (g)	= 148.4
9 T	13.45	12.41		39.68	36.63	0.083	10.020	161.0	155.7	708.4	87.9	8.79					
B	14.50	12.84	25.25	33.38	29.58	0.128	10.000	25.7	14.0	63.8	8.2	0.82	9.61	0.028	0.978	Soil Volume Translocated (m3)	= 0.022
10 T	14.46	13.24		34.58	31.69	0.091	10.015	114.6	114.9	523.1	69.3	6.93					
B	14.55	12.54	25.78	36.95	31.85	0.160	10.005	23.8	9.6	43.6	5.5	0.55	7.47	0.022	1.000	Soil Mass Translocated (kg)	= 25.3
Totals			286.2										338.27	1.000			
(extracted 09 91, analysed 12 91)																	
3 6 1 T	16.77	15.87		36.06	34.13	0.057	10.020	376.6	373.6	1699.3	269.6	26.96					
B	15.50	14.22	30.09	34.41	31.58	0.090	10.012	370.9	2208.7	*******	1429.8	142.98	169.94	0.356	0.356	Bulk Density at to (kg/m3)	= 1187
2 T	17.22	16.44		34.95	33.38	0.047	10.012	301.9	604.2	2750.9	452.3	45.23					
B	15.30	14.05	30.49	34.07	31.29	0.089	10.013	54.9	517.6	2356.0	331.0	33.10	78.33	0.164	0.520	Cl Added to Plot (g)	= 475
3 T	18.90	17.80		37.69	35.50	0.062	10.010	311.6	622.9	2836.6	504.8	50.48					
B	17.25	15.71	33.51	37.49	34.16	0.097	10.014	210.5	429.4	1954.3	307.1	30.71	81.19	0.170	0.690	Baseline Cl Recovered (g)	= 0
4 T	18.82	17.50		34.95	32.50	0.075	10.017	380.3	377.1	1715.8	300.2	30.02					
B	19.31	17.72	35.22	37.01	33.98	0.089	10.010	116.9	126.8	577.5	102.4	10.24	40.26	0.084	0.775	Total Cl Measured at ti (g)	= 477.3
5 T	18.24	17.17		33.29	31.34	0.062	10.010	232.2	471.5	2146.9	368.6	36.86					
B	18.32	16.63	33.80	36.46	33.11	0.101	10.020	24.2	20.7	94.2	15.7	1.57	38.42	0.081	0.855	Added Cl Recovered at ti (g)	= 477.3
6 T	18.46	17.24		33.20	31.01	0.071	10.014	173.3	180.3	820.8	141.5	14.15					
B	19.71	18.04	35.28	39.49	36.16	0.092	10.018	22.0	16.1	73.2	13.2	1.32	15.47	0.032	0.888	Cl Recovery Ratio	= 1.005
7 T	18.35	17.28		39.35	37.07	0.061	10.014	195.2	199.7	909.1	157.1	15.71					
B	18.30	16.74	34.03	34.08	31.19	0.093	10.013	27.2	24.2	110.3	18.5	1.85	17.56	0.037	0.924	Cl Translocated from Plot (g)	= 248.3
8 T	20.28	18.96		31.23	29.20	0.069	10.010	189.4	194.7	886.4	168.1	16.81					
B	19.81	18.23	37.19	35.73	32.89	0.086	10.018	23.0	18.4	83.6	15.2	1.52	18.33	0.038	0.963	Cl Not Translocated (g)	= 229.0
9 T	18.22	17.07		35.05	32.84	0.067	10.018	107.4	117.3	533.8	91.1	9.11					
B	16.22	14.84	31.91	33.53	30.68	0.093	10.016	20.6	12.7	58.0	8.6	0.86	9.97	0.021	0.984	Soil Volume Translocated (m3)	= 0.021
10 T	19.60	18.54		37.96	35.92	0.057	10.019	74.3	82.2	373.7	69.3	6.93					
B	20.25	18.38	36.92	35.31	32.06	0.101	10.018	19.5	10.5	47.8	8.8	0.88	7.81	0.016	1.000	Soil Mass Translocated (kg)	= 25.4
Totals			338.4										477.27	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 08 91, analysed 17 09 91)																
3 7	1 T	19.59	18.87		39.53	38.09	0.038	10.012	383.9	380.5	1732.4	327.0	32.70					
	B	21.97	20.50	39.37	36.26	33.84	0.072	10.013	97.3	645.8	2939.5	602.5	60.25	92.94	0.215	0.215	Bulk Density at to (kg/m3)	= 1203
	2 T	12.45	11.81		30.46	28.91	0.053	10.012	134.8	867.9	3951.1	466.8	46.68					
	B	16.91	15.97	27.79	37.04	35.00	0.058	10.020	140.7	901.4	4100.5	654.9	65.49	112.17	0.259	0.474	Cl Added to Plot (g)	= 475
	3 T	17.04	16.31		41.67	39.89	0.045	10.020	85.5	570.6	2595.7	423.3	42.33					
	B	17.19	16.04	32.35	35.43	33.07	0.071	10.018	65.4	435.3	1980.5	317.7	31.77	74.10	0.171	0.646	Baseline Cl Recovered (g)	= 4.03
	4 T	21.95	20.77		37.70	35.68	0.057	10.012	352.0	350.8	1597.1	331.7	33.17					
	B	23.26	21.60	42.37	38.82	36.06	0.077	10.016	22.6	18.8	85.7	18.5	1.85	35.02	0.081	0.727	Total Cl Measured at ti (g)	= 432.3
	5 T	15.46	14.59		38.40	36.24	0.060	10.018	199.1	202.5	921.5	134.4	13.44					
	B	17.16	16.23	30.82	36.82	34.84	0.057	10.008	167.5	174.8	796.3	129.2	12.92	26.36	0.061	0.788	Added Cl Recovered at ti (g)	= 432.3
	6 T	20.26	19.25		39.95	37.98	0.052	10.013	291.0	290.3	1321.5	254.4	25.44					
	B	20.97	19.46	38.72	38.46	35.70	0.077	10.015	36.4	36.9	167.9	32.7	3.27	28.71	0.066	0.854	Cl Recovery Ratio	= 0.918
	7 T	20.09	19.08		35.64	33.86	0.053	10.011	172.5	179.3	816.3	155.7	15.57					
	B	17.49	16.78	35.36	37.23	34.67	0.074	10.015	25.6	23.1	104.9	17.1	1.71	17.28	0.040	0.894	Cl Translocated from Plot (g)	= 205.1
	8 T	20.88	20.05		37.58	36.09	0.041	10.017	207.7	210.9	959.7	192.4	19.24					
	B	24.72	22.76	42.81	36.63	33.73	0.086	10.015	18.4	9.0	40.8	9.3	0.93	20.17	0.047	0.941	Cl Not Translocated (g)	= 227.2
	9 T	19.96	18.66		30.46	28.48	0.069	10.020	135.4	151.4	688.8	128.6	12.86					
	B	17.30	16.85	35.51	29.04	28.29	0.027	10.016	20.3	5.7	25.8	4.3	0.43	13.29	0.031	0.972	Soil Volume Translocated (m3)	= 0.025
	10 T	20.25	19.44		30.95	29.72	0.041	10.020	82.9	92.2	419.3	81.5	8.15					
	B	20.90	19.35	38.79	32.39	29.99	0.080	10.008	45.0	46.8	213.1	41.2	4.12	12.27	0.028	1.000	Soil Mass Translocated (kg)	= 30.2
Totals				363.9										432.32	1.000			
		(extracted 10 91, analysed 03 06 92)																
3 8	1 T	16.65	15.90		34.17	32.63	0.047	10.016	348.7	309.0	1406.1	223.5	22.35					
	B	17.09	15.64	31.54	36.10	33.05	0.092	10.005	209.3	978.3	4456.9	697.1	69.71	92.07	0.245	0.245	Bulk Density at to (kg/m3)	= 1181
	2 T	16.33	15.49		33.35	31.64	0.054	10.015	119.4	593.9	2702.8	418.6	41.86					
	B	19.52	18.07	33.56	33.98	31.47	0.080	10.016	182.1	866.9	3945.0	712.9	71.29	113.15	0.301	0.545	Cl Added to Plot (g)	= 475
	3 T	13.74	12.93		45.18	42.52	0.063	10.020	77.1	388.8	1768.7	228.6	22.86					
	B	15.66	14.45	27.38	29.59	27.32	0.083	10.017	79.6	402.3	1830.5	264.6	26.46	49.32	0.131	0.676	Baseline Cl Recovered (g)	= 0
	4 T	18.20	17.03		40.86	38.24	0.069	10.010	367.1	324.1	1475.7	251.3	25.13					
	B	18.71	16.97	34.00	31.85	28.90	0.102	10.012	74.6	75.5	343.7	58.3	5.83	30.96	0.082	0.758	Total Cl Measured at ti (g)	= 376.4
	5 T	17.32	16.23		37.71	35.35	0.067	10.005	387.2	340.4	1551.0	251.7	25.17					
	B	16.12	14.56	30.79	41.73	37.71	0.107	10.014	27.3	18.0	81.8	11.9	1.19	26.37	0.070	0.829	Added Cl Recovered at ti (g)	= 376.4
	6 T	19.21	4.63		42.71	10.30	3.147	10.018	363.2	320.9	1460.0	67.6	6.76					
	B	18.21	17.04	21.67	37.38	34.98	0.069	10.005	33.9	26.4	120.3	20.5	2.05	8.81	0.023	0.852	Cl Recovery Ratio	= 0.792
	7 T	11.29	10.67		39.21	37.08	0.058	10.005	285.1	257.0	1170.9	124.9	12.49					
	B	10.66	9.77	20.44	36.03	33.05	0.090	10.020	83.3	85.0	386.5	37.8	3.78	16.27	0.043	0.895	Cl Translocated from Plot (g)	= 205.2
	8 T	19.31	18.31		41.32	39.19	0.054	10.009	202.1	189.9	864.8	158.3	15.83					
	B	20.54	18.75	37.06	40.26	36.76	0.095	10.006	32.4	24.4	111.1	20.8	2.08	17.92	0.048	0.943	Cl Not Translocated (g)	= 171.2
	9 T	13.96	13.31		43.55	41.53	0.049	10.012	203.8	191.4	871.1	115.9	11.59					
	B	12.30	11.25	24.55	39.98	36.56	0.093	10.008	24.9	12.0	54.9	6.2	0.62	12.21	0.032	0.975	Soil Volume Translocated (m3)	= 0.023
	10 T	14.60	13.97		48.25	46.17	0.045	10.013	139.1	136.9	623.1	87.0	8.70					
	B	13.52	12.34	26.30	42.85	39.12	0.095	10.016	24.6	11.3	51.4	6.3	0.63	9.34	0.025	1.000	Soil Mass Translocated (kg)	= 26.6
Totals				287.3										376.40	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
3 9	1 T	14.50	13.20		38.88	35.41	0.098	10.021	226.4	231.9	1055.0	139.3	13.93					
	B	15.65	13.87	27.07	39.61	35.12	0.128	10.021	149.3	810.4	3685.9	511.3	51.13	65.06	0.186	0.186	Bulk Density at to (kg/m3)	= 1141
	2 T	16.84	15.37		37.18	33.94	0.095	10.020	313.4	305.5	1389.6	213.6	21.36					
	B	19.43	17.21	32.58	34.06	30.17	0.129	10.015	159.6	889.7	4049.4	696.9	69.69	91.05	0.260	0.446	Cl Added to Plot (g)	= 475
	3 T	15.68	14.29		41.23	37.60	0.097	10.017	333.8	327.1	1488.6	212.8	21.28					
	B	11.31	9.95	24.25	35.56	31.31	0.136	10.018	247.3	250.1	1138.1	113.3	11.33	32.60	0.093	0.540	Baseline Cl Recovered (g)	= 0
	4 T	17.86	16.09		38.97	35.12	0.110	10.008	410.9	410.9	1871.5	301.1	30.11					
	B	21.38	18.69	34.78	33.45	29.25	0.144	10.015	33.6	31.4	143.0	26.7	2.67	32.79	0.094	0.633	Total Cl Measured at ti (g)	= 349.7
	5 T	15.66	14.16		35.79	32.38	0.105	10.019	420.8	421.9	1919.4	271.9	27.19					
	B	13.77	12.01	26.17	34.91	30.46	0.146	10.005	34.3	32.7	148.8	17.9	1.79	28.97	0.083	0.716	Added Cl Recovered at ti (g)	= 349.7
	6 T	17.81	16.06		36.46	32.90	0.108	10.007	195.7	410.2	1868.4	300.1	30.01					
	B	18.82	16.38	32.44	38.54	33.55	0.149	10.014	29.4	24.6	111.9	18.3	1.83	31.85	0.091	0.807	Cl Recovery Ratio	= 0.736
	7 T	14.14	12.74		35.11	31.65	0.109	10.011	274.2	272.7	1241.7	158.2	15.82					
	B	14.31	12.54	25.28	41.98	36.80	0.141	10.009	32.2	29.1	132.4	16.6	1.66	17.48	0.050	0.857	Cl Translocated from Plot (g)	= 156.1
	8 T	15.46	13.85		34.13	30.59	0.116	10.011	207.3	214.9	978.2	135.5	13.55					
	B	14.76	12.94	26.79	38.50	33.77	0.140	10.017	24.0	11.9	54.2	7.0	0.70	14.25	0.041	0.898	Cl Not Translocated (g)	= 193.6
	9 T	16.89	15.13		34.67	31.07	0.116	10.013	202.9	210.9	959.8	145.2	14.52					
	B	16.40	14.39	29.52	37.98	33.33	0.139	10.013	22.7	7.8	35.3	5.1	0.51	15.03	0.043	0.941	Soil Volume Translocated (m3)	= 0.030
	10 T	17.11	15.30		34.92	31.23	0.118	10.020	291.1	286.5	1303.1	199.4	19.94					
	B	15.20	13.30	28.60	46.54	40.74	0.143	10.012	23.9	11.6	52.9	7.0	0.70	20.64	0.059	1.000	Soil Mass Translocated (kg)	= 34.7
Totals				287.5										349.72	1.000			
		(extracted 10 91, analysed 05 12 91)																
3 10*	1 T	13.86	12.35		39.55	35.26	0.121	10.012	138.6	149.4	680.1	84.0	8.40					
	B	17.74	15.45	27.80	34.50	30.06	0.148	10.010	243.0	470.6	2143.1	331.1	33.11	41.51	0.148	0.148	Bulk Density at to (kg/m3)	= 1147
	2 T	15.82	14.05		33.31	29.59	0.126	10.011	355.0	351.8	1601.8	225.0	22.50					
	B	17.92	15.64	29.68	36.65	31.99	0.146	10.018	188.5	977.0	4445.4	695.2	69.52	92.02	0.328	0.477	Cl Added to Plot (g)	= 475
	3 T	15.89	14.04		37.15	32.84	0.131	10.019	356.3	353.3	1607.1	225.7	22.57					
	B	13.14	11.35	25.39	36.06	31.17	0.157	10.015	186.2	385.4	1754.1	199.1	19.91	42.48	0.152	0.628	Baseline Cl Recovered (g)	= 5.97
	4 T	16.29	14.39		31.24	27.60	0.132	10.017	255.1	253.1	1151.7	165.7	16.57					
	B	23.36	19.97	34.36	37.55	32.14	0.168	10.020	23.2	18.2	83.0	16.6	1.66	18.23	0.065	0.693	Total Cl Measured at ti (g)	= 280.2
	5 T	18.02	15.81		37.96	33.32	0.139	10.013	201.4	203.3	925.5	146.3	14.63					
	B	14.08	12.05	27.86	45.57	39.00	0.168	10.016	17.8	6.1	27.6	3.3	0.33	14.97	0.053	0.747	Added Cl Recovered at ti (g)	= 280.2
	6 T	18.15	15.91		34.47	30.23	0.140	10.013	241.5	240.7	1095.6	174.3	17.43					
	B	24.17	23.20	39.11	37.87	36.36	0.042	10.015	17.1	4.7	21.4	5.0	0.50	17.93	0.064	0.811	Cl Recovery Ratio	= 0.597
	7 T	16.32	14.32		33.80	29.67	0.139	10.017	230.7	230.7	1049.8	150.3	15.03					
	B	16.15	13.79	28.11	36.59	31.24	0.171	10.016	16.4	3.6	16.5	2.3	0.23	15.26	0.054	0.865	Cl Translocated from Plot (g)	= 133.5
	8 T	18.38	16.06		37.35	32.65	0.144	10.018	215.1	216.2	983.6	158.0	15.80					
	B	20.86	17.84	33.90	34.25	29.29	0.169	10.010	16.3	3.5	15.8	2.8	0.28	16.08	0.057	0.923	Cl Not Translocated (g)	= 146.6
	9 T	15.82	13.72		39.06	33.90	0.152	10.020	130.9	142.2	646.9	88.8	8.88					
	B	15.66	13.42	27.14	36.87	31.60	0.167	10.020	16.2	3.2	14.7	2.0	0.20	9.07	0.032	0.955	Soil Volume Translocated (m3)	= 0.027
	10 T	17.22	14.88		36.92	31.92	0.157	10.020	174.0	180.6	821.3	122.2	12.22					
	B	20.98	17.85	32.74	42.50	36.18	0.175	10.011	17.2	4.9	22.1	3.9	0.39	12.62	0.045	1.000	Soil Mass Translocated (kg)	= 31.5
Totals				306.1										280.16	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
3 11	1 T*	11.90	11.28		38.81	36.79	0.055	10.020	72.6	73.3	333.6	37.6	3.76					
	B	15.84	14.48	25.75	39.84	36.42	0.094	10.008	213.0	993.1	4523.1	654.9	65.49	69.25	0.275	0.275	Bulk Density at to (kg/m3)	= 1135
	2 T*	10.88	10.29		39.49	37.37	0.057	10.018	191.3	180.7	822.2	84.6	8.46					
	B	11.74	10.74	21.03	40.76	37.32	0.092	10.015	196.8	927.5	4221.3	453.6	45.36	53.82	0.214	0.488	Cl Added to Plot (g)	= 475
	3 T*	11.40	10.80		42.46	40.24	0.055	10.010	186.4	176.6	804.3	86.9	8.69					
	B	12.53	11.26	22.06	45.10	40.54	0.113	10.005	316.5	282.3	1286.0	144.8	14.48	23.16	0.092	0.580	Baseline Cl Recovered (g)	= 4.63
	4 T	15.98	14.95		35.82	33.52	0.068	10.020	150.7	147.0	668.5	99.9	9.99					
	B	17.78	15.81	30.76	38.32	34.08	0.124	10.015	30.5	21.9	99.7	15.8	1.58	11.57	0.046	0.626	Total Cl Measured at ti (g)	= 252.1
	5 T	13.59	12.67		37.81	35.26	0.072	10.015	281.4	254.2	1156.7	146.6	14.66					
	B	23.16	20.55	33.22	42.15	37.41	0.127	10.007	26.6	16.2	73.9	15.2	1.52	16.18	0.064	0.690	Added Cl Recovered at ti (g)	= 252.1
	6 T	18.51	17.02		40.86	37.58	0.087	10.017	344.5	305.5	1390.2	236.6	23.66					
	B	25.84	22.91	39.93	34.17	30.30	0.128	10.017	22.6	6.9	31.5	7.2	0.72	24.39	0.097	0.787	Cl Recovery Ratio	= 0.536
	7 T	19.86	18.13		41.40	37.81	0.095	10.014	242.4	223.3	1016.3	184.3	18.43					
	B	17.92	15.73	33.86	43.13	37.87	0.139	10.017	22.0	5.8	26.4	4.1	0.41	18.84	0.075	0.862	Cl Translocated from Plot (g)	= 123.1
	8 T	15.93	14.67		28.07	25.86	0.086	10.015	181.1	172.4	784.4	115.1	11.51					
	B	20.19	17.77	32.44	44.24	38.94	0.136	10.016	27.5	18.1	82.6	14.7	1.47	12.98	0.051	0.913	Cl Not Translocated (g)	= 129.0
	9 T	16.90	15.44		36.06	32.97	0.094	10.011	173.3	166.0	755.7	116.7	11.67					
	B	15.94	13.95	29.39	39.53	34.60	0.142	10.013	23.1	8.1	36.7	5.1	0.51	12.18	0.048	0.962	Soil Volume Translocated (m3)	= 0.030
	10 T	15.50	14.27		28.86	26.58	0.086	10.013	140.6	138.2	629.1	89.8	8.98					
	B	17.22	15.13	29.40	40.45	35.54	0.138	10.009	24.2	10.4	47.5	7.2	0.72	9.70	0.038	1.000	Soil Mass Translocated (kg)	= 33.6
Totals				297.8										252.06	1.000			
		(extracted 10 91, analysed 05 12 91)																
3 12	1 T	14.02	13.12		32.53	30.45	0.068	10.016	174.2	186.4	848.5	111.3	11.13					
	B	16.86	15.32	28.44	38.89	35.34	0.100	10.013	222.0	1100.1	5007.6	767.1	76.71	87.84	0.267	0.267	Bulk Density at to (kg/m3)	= 1132
	2 T	13.79	12.79		35.76	33.18	0.077	10.018	319.2	311.6	1417.8	181.4	18.14					
	B	14.36	12.98	25.77	34.99	31.64	0.106	10.016	179.3	949.5	4321.0	560.9	56.09	74.23	0.226	0.493	Cl Added to Plot (g)	= 475
	3 T	15.24	14.08		36.55	33.79	0.082	10.017	374.1	370.6	1686.1	237.5	23.75					
	B	18.54	16.59	30.67	42.24	37.81	0.117	10.006	331.2	324.4	1477.6	245.1	24.51	48.26	0.147	0.639	Baseline Cl Recovered (g)	= 0
	4 T	16.76	15.44		39.70	36.58	0.085	10.013	323.3	316.0	1438.3	222.1	22.21					
	B	17.38	15.44	30.88	40.34	35.85	0.125	10.014	22.5	7.2	32.9	5.1	0.51	22.72	0.069	0.709	Total Cl Measured at ti (g)	= 328.9
	5 T	15.93	14.72		39.60	36.61	0.082	10.016	309.7	301.6	1372.4	202.1	20.21					
	B	15.79	13.94	28.66	41.22	36.40	0.132	10.012	24.4	13.1	59.9	8.3	0.83	21.04	0.064	0.773	Added Cl Recovered at ti (g)	= 328.9
	6 T	17.47	16.00		32.96	30.19	0.092	10.007	332.4	325.6	1483.3	237.3	23.73					
	B	15.73	13.86	29.86	39.28	34.63	0.134	10.011	21.3	3.7	17.1	2.4	0.24	23.97	0.073	0.845	Cl Recovery Ratio	= 0.692
	7 T	16.63	15.26		37.87	34.76	0.090	10.009	222.5	228.5	1040.5	158.7	15.87					
	B	18.47	16.33	31.59	41.65	36.83	0.131	10.008	24.8	14.4	65.6	10.7	1.07	16.95	0.052	0.897	Cl Translocated from Plot (g)	= 162.1
	8 T	14.19	13.04		39.11	35.95	0.088	10.016	213.1	220.1	1001.6	130.6	13.06					
	B	17.28	15.36	28.40	42.76	38.03	0.125	10.005	25.8	18.2	82.9	12.7	1.27	14.33	0.044	0.948	Cl Not Translocated (g)	= 166.8
	9 T	14.95	13.70		37.03	33.96	0.091	10.006	132.7	149.8	682.2	93.5	9.35					
	B	18.72	16.62	30.33	35.51	31.54	0.126	10.017	21.0	3.0	13.5	2.2	0.22	9.57	0.029	0.970	Soil Volume Translocated (m3)	= 0.025
	10 T	12.30	11.36		39.69	36.67	0.082	10.015	175.1	187.2	851.9	96.8	9.68					
	B	13.85	12.04	23.40	42.46	36.93	0.150	10.018	22.1	6.1	27.6	3.3	0.33	10.01	0.030	1.000	Soil Mass Translocated (kg)	= 28.7
Totals				288.0										328.92	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - S to N)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot
		(extracted 10 91, analysed 16 12 91)															
3 4	1 B	20.06	18.08		37.58	33.87	0.109	10.023	165.9	893.9	4064.9						
	2 T	14.86	13.71		35.35	32.62	0.084	10.017	316.1	617.4	2809.4						
	B	12.40	11.18		39.93	36.03	0.108	10.012	243.0	1184.7	5393.3						
	3 T	14.65	13.55		31.16	28.83	0.081	10.010	246.9	489.7	2229.9						
	B	14.65	13.17		36.59	32.91	0.112	10.020	263.1	521.2	2370.8						
	4 T	16.38	14.86		31.62	28.68	0.102	10.017	198.1	331.5	1508.4						
3 5	1 B	22.02	19.70		34.87	31.20	0.117	10.011	406.2	790.5	3599.2						
	2 T	16.06	14.52		33.41	30.21	0.106	10.015	280.8	548.7	2497.1						
	B	15.19	13.56		30.59	27.31	0.120	10.016	223.8	1116.9	5082.8						
	3 T	17.85	16.28		38.18	34.84	0.096	10.015	186.9	384.4	1749.3						
3 8	1 B	17.09	15.64		36.10	33.05	0.092	10.005	186.0	973.0	4432.7						
	2 T	16.33	15.49		33.35	31.64	0.054	10.015	336.6	650.7	2961.4						
	B	19.52	18.07		33.98	31.47	0.080	10.016	165.4	878.4	3997.2						
	3 T	13.74	12.93		45.18	42.52	0.063	10.020	204.4	401.7	1827.4						
	B	15.66	14.45		29.59	27.32	0.083	10.017	204.3	399.9	1819.7						
3 11	1 B	15.84	14.48		39.84	36.42	0.094	10.008	186.9	977.5	4451.9						
	2 B	11.74	10.74		40.76	37.32	0.092	10.015	187.1	982.4	4471.0						
3 3	10 T	13.20	12.00		34.05	30.96	0.100	10.013	209.1	215.5	981.0						
	B	12.20	10.64		28.29	24.68	0.146	10.010	25.5	18.9	85.8						
3 7	10 T	20.25	19.44		30.95	29.72	0.041	10.020	47.2	44.7	203.3						
	B	20.90	19.35		32.39	29.99	0.080	10.008	33.9	28.6	130.1						
		(extracted 10 91, analysed 04 06 92)															
3 3	10 T	13.20	12.00		34.05	30.96	0.100	10.013	237.1	214.6	977.0						
	B	12.20	10.64	22.64	28.29	24.68	0.146	10.010	27.5	21.6	98.5						
3 7	9 T	16.89	15.13		34.67	31.07	0.116	10.013	17.1	5.5	25.1						
	B	16.40	14.39	29.52	37.98	33.33	0.139	10.013	156.1	147.5	671.6						
	10 T	17.11	15.30		34.92	31.23	0.118	10.020	50.7	50.3	229.0						
	B	20.90	19.35	34.65	32.39	29.99	0.080	10.008	37.9	34.5	157.1						
3 9	6 T	17.81	16.06		36.46	32.90	0.108	10.007	89.9	458.5	2088.3						
	B	18.82	16.38	32.44	38.54	33.55	0.149	10.014	26.5	21.2	96.3						
	7 T	14.14	12.74		35.11	31.65	0.109	10.011	300.5	259.3	1180.7						
	B	14.31	12.54	25.28	41.98	36.80	0.14[illegible]	10.009	31.4	26.6	121.3						
	8 T	15.46	13.85		34.13	30.59	0.116	10.011	224.6	200.4	912.6						
	B	14.76	12.94	26.79	38.50	33.77	0.140	10.017	14.7	4.2	19.1						
	9 T	16.89	15.13		34.67	31.07	0.116	10.013	220.4	197.0	897.0						
	B	16.40	14.39	29.52	37.98	33.33	0.139	10.013	12.7	2.2	9.9						
	10 T	17.11	15.30		34.92	31.23	0.118	10.020	310.4	266.7	1213.1						
	B	15.20	13.30	28.60	46.54	40.74	0.143	10.012	14.5	4.0	18.1						

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 11 91, analysed 04 06 92)																
4 1	1 T	11.83	10.64		32.04	28.84	0.111	10.018	328.9	291.6	1326.7	141.2	14.12					
	B	13.58	11.71	22.35	32.15	27.74	0.159	10.017	245.9	1116.3	5079.3	594.8	59.48	73.60	0.190	0.190	Bulk Density at to (kg/m3)	= 1123
	2 T	15.66	14.06		36.95	33.17	0.114	10.012	123.1	592.2	2696.0	378.9	37.89					
	B	20.84	17.78	31.83	36.06	30.77	0.172	10.019	199.9	919.8	4184.4	743.8	74.38	112.27	0.290	0.480	Cl Added to Plot (g)	= 475
	3 T	19.50	17.27		29.24	25.90	0.129	10.013	88.2	431.9	1965.9	339.4	33.94					
	B	16.29	13.92	31.19	38.69	33.08	0.170	10.006	80.6	394.2	1795.9	250.0	25.00	58.95	0.152	0.632	Baseline Cl Recovered (g)	= 0
	4 T	19.60	17.18		31.41	27.54	0.141	10.016	78.1	381.5	1736.3	298.3	29.83					
	B	10.32	8.74	25.92	34.00	28.82	0.180	10.017	51.4	51.0	232.1	20.3	2.03	31.86	0.082	0.715	Total Cl Measured at ti (g)	= 387.1
	5 T	16.46	14.42		31.33	27.45	0.141	10.017	388.3	343.9	1565.0	225.6	22.56					
	B	14.65	12.42	26.84	36.85	31.25	0.179	10.008	24.0	17.9	81.5	10.1	1.01	23.58	0.061	0.776	Added Cl Recovered at ti (g)	= 387.1
	6 T	15.10	13.23		38.42	33.67	0.141	10.011	361.3	320.2	1457.7	192.9	19.29					
	B	16.58	14.07	27.30	41.03	34.83	0.178	10.006	23.6	17.0	77.3	10.9	1.09	20.37	0.053	0.828	Cl Recovery Ratio	= 0.815
	7 T	14.80	13.09		32.77	28.99	0.130	10.015	79.5	388.5	1768.0	231.4	23.14					
	B	14.32	12.13	25.22	38.25	32.40	0.180	10.019	20.3	10.5	47.9	5.8	0.58	23.72	0.061	0.890	Cl Translocated from Plot (g)	= 201.2
	8 T	12.12	10.59		38.15	33.34	0.144	10.015	348.4	308.8	1405.4	148.8	14.88					
	B	12.27	10.47	21.06	35.85	30.61	0.171	10.017	30.8	25.4	115.5	12.1	1.21	16.09	0.042	0.931	Cl Not Translocated (g)	= 185.9
	9 T	15.77	13.72		35.66	31.02	0.149	10.017	273.5	244.8	1113.8	152.8	15.28					
	B	12.95	11.00	24.72	35.34	30.04	0.176	10.012	20.0	10.0	45.6	5.0	0.50	15.78	0.041	0.972	Soil Volume Translocated (m3)	= 0.026
	10 T	14.96	13.07		37.43	32.72	0.144	10.015	179.6	166.7	758.6	99.2	9.92					
	B	15.67	13.25	26.33	33.75	28.56	0.182	10.009	23.0	15.7	71.3	9.5	0.95	10.86	0.028	1.000	Soil Mass Translocated (kg)	= 29.4
Totals				262.8										387.08	1.000			
		(extracted 10 91, analysed 04 06 92)																
4 2	1 T	14.24	12.97		32.47	29.59	0.097	10.009	79.3	386.5	1759.9	228.3	22.83					
	B	13.09	11.35	24.33	33.47	29.04	0.153	10.017	248.3	1138.8	5181.9	588.3	58.83	81.66	0.221	0.221	Bulk Density at to (kg/m3)	= 1143
	2 T	18.44	16.56		35.63	32.01	0.113	10.017	118.0	591.0	2689.4	445.4	44.54					
	B	18.96	16.36	32.92	35.96	31.04	0.159	10.017	285.1	1273.1	5792.9	947.7	94.77	139.32	0.376	0.597	Cl Added to Plot (g)	= 475
	3 T	16.81	14.84		33.85	29.89	0.132	10.010	68.0	309.1	1407.4	208.9	20.89					
	B	16.94	14.40	29.24	40.38	34.34	0.176	10.017	180.5	165.3	752.2	108.3	10.83	31.72	0.086	0.683	Baseline Cl Recovered (g)	= 0
	4 T	15.01	13.18		31.32	27.51	0.138	10.018	319.8	276.0	1255.8	165.5	16.55					
	B	11.88	9.99	23.17	33.92	28.54	0.188	10.009	27.0	20.7	94.3	9.4	0.94	17.50	0.047	0.730	Total Cl Measured at ti (g)	= 370.1
	5 T	16.52	14.47		36.17	31.69	0.142	10.017	78.3	379.3	1725.7	249.7	24.97					
	B	18.55	15.77	30.24	33.33	28.35	0.176	10.018	30.5	23.6	107.3	16.9	1.69	26.66	0.072	0.802	Added Cl Recovered at ti (g)	= 370.1
	6 T	19.37	16.97		39.25	34.40	0.141	10.019	319.3	275.5	1253.3	212.7	21.27					
	B	19.16	16.15	33.12	38.54	32.50	0.186	10.016	25.1	19.2	87.3	14.1	1.41	22.68	0.061	0.863	Cl Recovery Ratio	= 0.779
	7 T	15.81	13.89		37.14	32.64	0.138	10.013	285.1	247.7	1127.7	156.6	15.66					
	B	14.84	12.61	26.50	35.97	30.58	0.176	10.020	19.3	10.3	46.9	5.9	0.59	16.25	0.044	0.907	Cl Translocated from Plot (g)	= 221.0
	8 T	15.77	12.25		35.52	27.60	0.287	10.020	148.6	139.7	635.3	77.8	7.78					
	B	14.69	12.38	24.63	36.27	30.57	0.187	10.010	16.1	5.7	26.2	3.2	0.32	8.11	0.022	0.929	Cl Not Translocated (g)	= 149.1
	9 T	15.91	14.07		33.94	30.03	0.130	10.018	217.5	194.7	885.8	124.7	12.47					
	B	20.13	17.84	31.91	33.95	30.10	0.128	10.020	13.7	3.1	14.1	2.5	0.25	12.72	0.034	0.964	Soil Volume Translocated (m3)	= 0.022
	10 T	16.09	14.24		36.35	32.18	0.130	10.013	226.4	201.9	919.0	130.9	13.09					
	B	16.44	13.92	28.16	42.57	36.05	0.181	10.017	16.1	5.7	26.0	3.6	0.36	13.45	0.036	1.000	Soil Mass Translocated (kg)	= 25.1
Totals				284.2										370.05	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
4 3	1 T	15.55	14.26		39.04	35.78	0.091	10.012	345.4	338.6	1541.6	219.6	21.96					
	B	16.31	14.26	28.50	36.94	32.31	0.143	10.018	365.1	360.8	1641.5	234.1	23.41	45.37	0.142	0.142	Bulk Density at to (kg/m3)	= 1153
	2 T	22.14	20.19		34.12	31.13	0.096	10.020	331.2	650.4	2958.5	597.4	59.74					
	B	28.23	24.98	45.17	33.82	29.93	0.130	10.009	147.4	807.3	3676.2	918.3	91.83	151.58	0.474	0.616	Cl Added to Plot (g)	= 475
	3 T	16.32	14.72		40.21	36.29	0.108	10.010	184.2	194.6	885.9	130.4	13.04					
	B	12.56	11.18	25.90	38.95	34.67	0.123	10.013	273.0	270.7	1232.3	137.7	13.77	26.82	0.084	0.700	Baseline Cl Recovered (g)	= 4.77
	4 T	18.62	16.61		37.46	33.43	0.121	10.012	135.5	152.4	693.7	115.2	11.52					
	B	18.19	15.78	32.39	37.19	32.27	0.152	10.012	35.6	35.2	160.1	25.3	2.53	14.05	0.044	0.744	Total Cl Measured at ti (g)	= 319.5
	5 T	15.30	13.76		40.24	36.20	0.111	10.019	304.6	297.2	1352.0	186.1	18.61					
	B	12.66	10.95	24.71	36.23	31.35	0.156	10.014	26.9	20.8	94.9	10.4	1.04	19.64	0.061	0.806	Added Cl Recovered at ti (g)	= 319.5
	6 T	17.61	15.78		35.44	31.76	0.116	10.011	209.5	216.8	987.3	155.8	15.58					
	B	15.85	13.74	29.52	38.13	33.11	0.152	10.017	23.0	8.7	39.6	5.4	0.54	16.12	0.050	0.856	Cl Recovery Ratio	= 0.679
	7 T	19.34	17.18		39.81	35.37	0.125	10.008	183.9	194.3	885.0	152.1	15.21					
	B	16.31	15.86	33.04	39.37	34.11	0.154	10.020	22.9	8.4	38.0	6.0	0.60	15.81	0.049	0.906	Cl Translocated from Plot (g)	= 196.9
	8 T	16.52	14.32		40.03	36.00	0.112	10.012	188.7	198.1	902.0	129.2	12.92					
	B	12.76	11.47	25.79	35.13	30.46	0.153	10.012	22.4	6.9	31.4	3.6	0.36	13.28	0.042	0.947	Cl Not Translocated (g)	= 122.6
	9 T	18.62	16.59		32.58	29.04	0.122	10.020	129.4	146.6	667.0	110.7	11.07					
	B	16.96	14.67	31.26	43.59	37.70	0.156	10.020	21.1	3.2	14.5	2.1	0.21	11.28	0.035	0.983	Soil Volume Translocated (m3)	= 0.021
	10 T	15.05	13.42		34.13	30.45	0.121	10.010	72.6	86.2	392.7	52.7	5.27					
	B	14.43	12.50	25.92	40.28	34.90	0.154	10.019	21.7	5.0	22.9	2.9	0.29	5.56	0.017	1.000	Soil Mass Translocated (kg)	= 24.1
Totals				302.2										319.50	1.000			
		(extracted 09 91, analysed 17 09 91)																
4 4	1 T	18.28	16.87		37.00	34.15	0.084	10.016	352.9	350.7	1596.1	269.2	26.92					
	B	14.04	12.58	29.44	29.96	26.84	0.116	10.016	340.1	677.6	3083.8	387.8	38.78	65.70	0.192	0.192	Bulk Density at to (kg/m3)	= 1163
	2 T	16.80	15.25		36.88	33.49	0.101	10.016	215.7	439.5	2000.0	305.0	30.50					
	B	15.29	13.72	28.97	36.47	32.74	0.114	10.014	283.0	1693.4	7707.5	1057.8	******	136.28	0.398	0.590	Cl Added to Plot (g)	= 475
	3 T	20.90	18.62		34.40	30.65	0.122	10.018	155.6	164.1	746.5	139.0	13.90					
	B	17.77	15.76	34.38	34.41	30.54	0.127	10.014	248.4	250.1	1138.2	179.4	17.94	31.84	0.093	0.683	Baseline Cl Recovered (g)	= 0
	4 T	18.30	16.33		33.44	29.85	0.120	10.010	159.5	167.6	763.3	124.6	12.46					
	B	17.32	15.41	31.74	42.44	37.76	0.124	10.020	37.4	38.2	173.9	26.8	2.68	15.14	0.044	0.727	Total Cl Measured at ti (g)	= 342.2
	5 T	18.56	16.81		37.60	34.07	0.104	10.015	282.1	282.0	1283.2	215.8	21.58					
	B	15.19	13.45	30.26	36.38	32.21	0.129	10.019	29.2	27.4	124.7	16.8	1.68	23.25	0.068	0.795	Added Cl Recovered at ti (g)	= 342.2
	6 T	20.35	18.50		39.60	36.01	0.100	10.020	262.5	263.5	1198.5	221.7	22.17					
	B	18.27	16.24	34.74	36.47	32.43	0.124	10.020	18.0	8.1	37.0	6.0	0.60	22.77	0.067	0.862	Cl Recovery Ratio	= 0.721
	7 T	17.79	16.30		33.33	30.55	0.091	10.020	141.1	150.6	685.1	111.7	11.17					
	B	13.92	12.46	28.76	32.77	29.34	0.117	10.017	30.5	26.7	121.7	15.2	1.52	12.68	0.037	0.899	Cl Translocated from Plot (g)	= 202.0
	8 T	17.43	16.02		36.03	33.13	0.088	10.017	171.0	178.0	809.7	129.7	12.97					
	B	17.98	16.10	32.12	35.27	31.59	0.117	10.010	17.4	7.1	32.2	5.2	0.52	13.49	0.039	0.938	Cl Not Translocated (g)	= 140.3
	9 T	18.14	16.70		34.81	32.05	0.086	10.020	149.8	158.7	722.1	120.6	12.06					
	B	14.96	13.45	30.15	35.73	32.13	0.112	10.019	20.7	14.2	64.5	8.7	0.87	12.92	0.038	0.976	Soil Volume Translocated (m3)	= 0.022
	10 T	16.10	14.80		33.07	30.41	0.088	10.012	103.3	113.8	517.9	76.6	7.66					
	B	16.16	14.57	29.37	29.97	27.02	0.109	10.009	17.6	7.3	33.3	4.8	0.48	8.15	0.024	1.000	Soil Mass Translocated (kg)	= 25.6
Totals				309.9										342.25	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PBD (g/g)	SSBD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
4 5	1 T	17.22	15.50		34.48	31.04	0.111	10.000	79.2	399.8	1822.4	282.5	28.25					
	B	16.00	14.15	29.65	34.04	30.11	0.131	10.014	215.1	1001.5	4558.6	645.0	64.50	92.74	0.314	0.314	Bulk Density at to (kg/m3)	= 1161
	2 T	17.32	15.53		33.92	30.43	0.115	10.016	75.0	377.5	1718.0	266.8	26.68					
	B	14.70	12.96	28.49	27.46	24.22	0.134	10.015	183.6	873.1	3973.7	515.0	51.50	78.18	0.265	0.579	Cl Added to Plot (g)	= 475
	3 T	16.51	14.75		30.77	27.49	0.119	10.011	244.1	224.2	1021.0	150.6	15.06					
	B	18.22	16.06	30.80	32.29	28.46	0.134	10.020	84.7	86.4	393.0	63.1	6.31	21.37	0.072	0.651	Baseline Cl Recovered (g)	= 4.61
	4 T	19.35	17.18		34.39	30.54	0.126	10.010	292.0	260.8	1187.6	204.0	20.40					
	B	17.99	15.79	32.97	36.02	31.62	0.139	10.012	22.7	9.2	42.0	6.6	0.66	21.07	0.071	0.723	Total Cl Measured at ti (g)	= 295.3
	5 T	15.21	13.51		31.62	28.08	0.126	10.020	260.0	236.7	1076.5	145.4	14.54					
	B	13.93	12.26	25.77	32.74	28.84	0.135	10.020	24.8	13.9	63.0	7.7	0.77	15.31	0.052	0.774	Added Cl Recovered at ti (g)	= 295.3
	6 T	16.23	14.48		34.04	30.38	0.121	10.013	345.1	305.1	1389.0	201.1	20.11					
	B	15.12	13.25	27.73	36.15	31.68	0.141	10.015	28.0	19.7	89.4	11.8	1.18	21.30	0.072	0.847	Cl Recovery Ratio	= 0.628
	7 T	16.89	15.20		28.83	25.95	0.111	10.016	254.7	232.6	1058.3	160.8	16.08					
	B	18.36	16.21	31.41	37.00	32.68	0.132	10.019	23.1	10.0	45.7	7.4	0.74	16.83	0.057	0.904	Cl Translocated from Plot (g)	= 170.9
	8 T	16.77	15.07		32.87	29.54	0.113	10.018	155.5	151.2	688.0	103.7	10.37					
	B	16.85	15.14	30.21	31.40	28.21	0.113	10.014	23.0	9.7	44.3	6.7	0.67	11.04	0.037	0.941	Cl Not Translocated (g)	= 124.3
	9 T	19.89	17.82		34.10	30.56	0.116	10.005	136.5	134.6	613.4	109.3	10.93					
	B	18.06	16.25	34.06	31.69	28.51	0.111	10.006	18.6	1.9	8.8	1.4	0.14	11.07	0.037	0.978	Soil Volume Translocated (m3)	= 0.023
	10 T	17.37	15.65		31.31	28.22	0.110	10.009	84.5	86.1	392.3	61.4	6.14					
	B	15.37	13.90	29.55	31.83	28.80	0.105	10.005	19.7	3.6	16.5	2.3	0.23	6.37	0.022	1.000	Soil Mass Translocated (kg)	= 26.4
Totals				300.6										295.27	1.000			
		(extracted 09 91, analysed 17 09 91)																
4 6	1 T	17.06	16.37		38.70	37.14	0.042	10.012	112.9	123.4	561.6	91.9	9.19					
	B	17.50	16.62	32.99	37.90	36.01	0.053	10.011	262.4	1582.2	7203.7	1197.4	******	128.93	0.312	0.312	Bulk Density at to (kg/m3)	= 1187
	2 T	23.64	22.65		33.76	32.35	0.044	10.013	331.0	329.2	1498.4	339.3	33.93					
	B	24.45	23.20	45.85	37.34	35.45	0.053	10.019	219.6	1345.1	6119.5	1420.0	******	175.93	0.426	0.739	Cl Added to Plot (g)	= 475
	3 T	15.87	15.37		37.69	36.51	0.032	10.020	225.0	227.6	1035.5	159.2	15.92					
	B	12.52	11.95	27.32	42.10	40.19	0.047	10.019	158.0	166.3	756.4	90.4	9.04	24.95	0.060	0.799	Baseline Cl Recovered (g)	= 0
	4 T	19.27	18.70		37.51	36.42	0.030	10.017	59.4	65.8	299.6	56.0	5.60					
	B	17.45	16.66	35.37	41.68	39.82	0.047	10.014	20.0	12.5	56.9	9.5	0.95	6.55	0.016	0.815	Total Cl Measured at ti (g)	= 412.7
	5 T	14.09	13.73		42.18	41.11	0.026	10.020	65.4	72.5	330.0	45.3	4.53					
	B	12.07	11.42	25.15	43.21	40.91	0.056	10.012	29.2	27.3	124.4	14.2	1.42	5.95	0.014	0.829	Added Cl Recovered at ti (g)	= 412.7
	6 T	18.48	17.94		31.48	30.57	0.030	10.018	74.9	83.2	378.4	67.9	6.79					
	B	15.93	15.21	33.15	38.12	36.40	0.047	10.017	26.6	24.2	110.3	16.8	1.68	8.47	0.021	0.850	Cl Recovery Ratio	= 0.869
	7 T	18.50	17.92		31.47	30.49	0.032	10.009	130.6	140.6	640.4	114.8	11.48					
	B	18.37	17.30	35.21	39.13	36.86	0.062	10.009	43.4	47.2	214.8	37.1	3.71	15.19	0.037	0.887	Cl Translocated from Plot (g)	= 304.9
	8 T	16.73	16.13		35.94	34.66	0.037	10.010	203.9	207.2	943.5	152.2	15.22					
	B	16.59	15.59	31.72	37.46	35.21	0.064	10.016	28.5	26.5	120.8	18.8	1.88	17.10	0.041	0.928	Cl Not Translocated (g)	= 107.8
	9 T	15.69	15.19		36.35	35.20	0.033	10.014	185.7	190.8	868.5	131.9	13.19					
	B	12.86	12.07	27.26	40.97	38.47	0.065	10.015	31.8	30.7	139.6	16.8	1.68	14.88	0.036	0.964	Soil Volume Translocated (m3)	= 0.017
	10 T	14.65	14.07		39.54	37.99	0.041	10.020	208.0	211.2	960.7	135.2	13.52					
	B	12.88	11.93	26.00	39.38	36.48	0.080	10.019	25.3	22.7	103.2	12.3	1.23	14.75	0.036	1.000	Soil Mass Translocated (kg)	= 19.8
Totals				320.0										412.70	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot		
		(extracted 10 91, analysed 13 12 91)																	
4 7 1	T	20.38	19.65		33.02	31.85	0.037	10.015	157.7	526.6	2396.4	471.0	47.10						
	B	20.08	19.27	38.93	33.58	32.24	0.042	10.020	308.7	602.0	2738.4	527.7	52.77	99.87	0.501		Bulk Density at to (kg/m3)	=	1203
2	T	16.30	15.74		30.42	29.38	0.036	10.009	164.6	493.3	2246.6	353.5	35.35						
	B	20.84	19.93	35.67	31.73	30.36	0.045	10.020	245.3	705.8	3210.4	640.0	64.00	99.35	0.499		Cl Added to Plot (g)	=	475
3	T																		
	B			0.00											0.000		Baseline Cl Recovered (g)	=	5.07
4	T																		
	B			0.00											0.000		Total Cl Measured at ti (g)	=	199.2
5	T																		
	B			0.00											0.000		Added Cl Recovered at ti (g)	=	199.2
6	T																		
	B			0.00											0.000		Cl Recovery Ratio	=	0.424
7	T																		
	B			0.00											0.000		Cl Translocated from Plot (g)	=	199.2
8	T																		
	B			0.00											0.000		Cl Not Translocated (g)	=	0.0
9	T																		
	B			0.00											0.000		Soil Volume Translocated (m3)	=	0.000
10	T																		
	B			0.00											0.000		Soil Mass Translocated (kg)	=	0.0
Totals				74.6											1.000				
		(extracted 10 91, analysed 03 06 92)																	
4 8 1	T	18.40	17.68		36.46	35.05	0.040	10.013	270.8	244.9	1115.0	197.2	19.72						
	B	19.77	18.39	36.07	32.42	30.16	0.075	10.020	124.7	618.0	2811.2	517.0	51.70	71.41	0.241	0.241	Bulk Density at to (kg/m3)	=	1181
2	T	19.17	18.28		33.40	31.86	0.048	10.012	68.4	343.1	1562.1	285.6	28.56						
	B	19.17	17.78	36.06	35.64	33.07	0.078	10.009	120.5	598.9	2727.3	485.0	48.50	77.05	0.260	0.502	Cl Added to Plot (g)	=	475
3	T	17.35	16.55		29.82	28.44	0.048	10.020	269.9	244.3	1111.1	183.8	18.38						
	B	16.23	14.91	31.46	35.12	32.28	0.088	10.020	93.6	95.3	433.4	64.6	6.46	24.85	0.084	0.586	Baseline Cl Recovered (g)	=	0
4	T	16.96	16.11		37.51	35.65	0.052	10.016	238.0	219.4	998.5	160.9	16.09						
	B	13.49	12.36	28.47	35.07	32.14	0.091	10.007	20.5	5.0	22.6	2.8	0.28	16.37	0.055	0.641	Total Cl Measured at ti (g)	=	295.8
5	T	16.32	15.56		36.82	35.11	0.049	10.012	296.2	263.9	1201.5	186.9	18.69						
	B	19.09	17.50	33.06	35.91	32.92	0.091	10.017	19.9	3.9	17.6	3.1	0.31	19.00	0.064	0.705	Added Cl Recovered at ti (g)	=	295.8
6	T	17.33	16.56		38.83	37.12	0.046	10.016	277.2	249.8	1136.7	188.3	18.83						
	B	15.59	14.23	30.80	35.73	32.63	0.095	10.007	19.1	2.7	12.5	1.8	0.18	19.01	0.064	0.770	Cl Recovery Ratio	=	0.623
7	T	16.53	15.36		34.87	32.40	0.076	10.012	325.0	287.9	1310.9	201.3	20.13						
	B	15.12	13.81	29.17	37.51	34.27	0.094	10.012	19.2	2.8	12.7	1.8	0.18	20.31	0.069	0.838	Cl Translocated from Plot (g)	=	148.5
8	T	18.10	17.35		35.30	33.84	0.043	10.018	292.7	261.3	1189.0	206.3	20.63						
	B	21.33	19.48	36.83	32.08	29.31	0.095	10.017	21.0	5.9	27.0	5.3	0.53	21.15	0.072	0.910	Cl Not Translocated (g)	=	147.3
9	T	13.52	12.87		33.58	31.98	0.050	10.015	218.1	203.4	925.6	119.1	11.91						
	B	10.77	9.85	22.72	32.40	29.64	0.093	10.000	28.6	20.4	92.8	9.1	0.91	12.83	0.043	0.953	Soil Volume Translocated (m3)	=	0.029
10	T	17.27	16.49		35.25	33.67	0.047	10.020	190.9	180.8	822.3	135.6	13.56						
	B	17.74	16.19	32.69	30.46	27.81	0.095	10.017	19.6	3.5	16.0	2.6	0.26	13.82	0.047	1.000	Soil Mass Translocated (kg)	=	34.8
Totals				317.3										295.80	1.000				

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 05 12 91)																
4 9 1	T	15.77	13.68		37.92	32.91	0.152	10.012	273.6	272.2	1239.4	169.5	16.95					
	B	11.33	10.06	23.74	41.98	37.29	0.126	10.009	184.9	993.1	4522.6	455.0	45.50	62.45	0.182	0.182	Bulk Density at to (kg/m3)	= 1141
2	T	15.96	14.27		37.88	33.88	0.118	10.014	206.1	409.1	1862.2	265.8	26.58					
	B	19.04	16.98	31.25	35.97	32.09	0.121	10.017	268.3	1255.4	5712.5	970.0	97.00	123.58	0.360	0.542	Cl Added to Plot (g)	= 475
3	T	14.14	12.51		33.85	29.96	0.130	10.020	340.8	669.9	3047.4	381.2	38.12					
	B	15.65	13.95	26.46	36.35	32.41	0.121	10.013	220.3	226.5	1031.2	143.9	14.39	52.51	0.153	0.695	Baseline Cl Recovered (g)	= 0
4	T	19.53	17.43		35.09	31.32	0.120	10.020	141.3	157.8	717.6	125.1	12.51					
	B	16.99	14.96	32.38	33.65	29.63	0.136	10.012	89.6	106.5	485.0	72.5	7.25	19.76	0.058	0.753	Total Cl Measured at ti (g)	= 343.0
5	T	15.88	14.23		39.44	35.35	0.116	10.014	265.4	265.4	1208.2	171.9	17.19					
	B	16.02	14.06	28.29	35.86	31.48	0.139	10.015	28.2	22.7	103.4	14.5	1.45	18.65	0.054	0.807	Added Cl Recovered at ti (g)	= 343.0
6	T	16.57	14.79		36.24	32.35	0.120	10.020	244.3	247.6	1126.1	166.5	16.65					
	B	16.78	14.70	29.49	38.37	33.62	0.141	10.009	24.4	13.2	60.3	8.9	0.89	17.54	0.051	0.859	Cl Recovery Ratio	= 0.722
7	T	15.14	13.57		31.47	28.21	0.115	10.020	222.7	228.7	1040.2	141.1	14.11					
	B	14.75	12.90	26.47	37.25	32.58	0.143	10.020	26.2	19.6	89.1	11.5	1.15	15.26	0.044	0.903	Cl Translocated from Plot (g)	= 186.0
8	T	13.63	12.23		30.43	27.31	0.11[illegible]	10.020	189.9	199.1	905.5	110.7	11.07					
	B	13.97	12.25	24.48	35.57	31.20	0.140	10.020	28.0	22.4	101.8	12.5	1.25	12.32	0.036	0.939	Cl Not Translocated (g)	= 157.0
9	T	14.79	13.31		38.36	34.52	0.111	10.011	145.7	161.8	736.5	98.0	9.80					
	B	15.43	13.48	26.78	35.44	30.97	0.145	10.014	24.7	14.1	64.2	8.6	0.86	10.67	0.031	0.970	Soil Volume Translocated (m3)	= 0.023
10	T	13.87	12.52		33.84	30.56	0.107	10.016	138.2	154.9	704.9	88.3	8.83					
	B	15.57	13.67	26.19	35.61	31.29	0.138	10.005	28.5	23.2	105.6	14.4	1.44	10.27	0.030	1.000	Soil Mass Translocated (kg)	= 25.9
Totals				275.5										343.01	1.000			
		(extracted 10 91, analysed 06 12 91)																
4 10 1	T	16.90	14.97		34.25	30.35	0.129	10.015	278.0	278.8	1269.0	190.0	19.00					
	B	15.47	13.44	28.41	36.19	31.46	0.150	10.017	160.9	858.8	3907.8	525.3	52.53	71.53	0.204	0.204	Bulk Density at to (kg/m3)	= 1147
2	T	15.79	13.99		37.76	33.46	0.129	10.019	287.7	570.1	2593.8	362.8	36.28					
	B	13.79	12.02	26.01	36.43	31.78	0.147	10.009	232.0	1151.3	5242.8	630.3	63.03	99.31	0.283	0.487	Cl Added to Plot (g)	= 475
3	T	18.32	16.18		36.55	32.29	0.132	10.012	354.5	687.4	3129.4	506.4	50.64					
	B	20.39	17.60	33.78	37.73	32.58	0.158	10.010	205.7	410.8	1870.7	329.3	32.93	83.57	0.238	0.726	Baseline Cl Recovered (g)	= 5.22
4	T	17.07	15.12		29.87	26.48	0.128	10.020	412.0	406.8	1850.7	279.9	27.99					
	B	17.49	15.01	30.13	31.34	26.90	0.165	10.009	50.0	59.0	268.7	40.3	4.03	32.02	0.091	0.817	Total Cl Measured at ti (g)	= 350.5
5	T	16.56	14.55		29.49	25.92	0.138	10.021	279.0	279.7	1272.0	185.1	18.51					
	B	16.18	13.84	28.39	31.19	26.68	0.169	10.012	38.5	39.3	178.7	24.7	2.47	20.99	0.060	0.877	Added Cl Recovered at ti (g)	= 350.5
6	T	16.94	14.97		31.05	27.45	0.131	10.016	234.1	241.4	1098.6	164.4	16.44					
	B	18.54	15.88	30.85	36.92	31.64	0.167	10.012	27.4	15.4	70.3	11.2	1.12	17.56	0.050	0.927	Cl Recovery Ratio	= 0.746
7	T	15.48	13.60		33.29	29.25	0.138	10.008	128.2	147.3	670.9	91.2	9.12					
	B	13.77	11.75	25.35	35.11	29.98	0.171	10.017	24.1	7.9	36.1	4.2	0.42	9.55	0.027	0.954	Cl Translocated from Plot (g)	= 170.8
8	T	16.60	14.64		32.67	28.82	0.133	10.015	80.9	98.4	447.7	65.5	6.55					
	B	15.39	13.12	27.76	35.01	29.86	0.172	10.009	24.2	8.2	37.3	4.9	0.49	7.04	0.020	0.974	Cl Not Translocated (g)	= 179.7
9	T	17.19	15.08		29.10	25.53	0.140	10.015	58.4	69.5	316.3	47.7	4.77					
	B	13.02	11.07	26.14	27.72	23.57	0.176	10.009	22.5	4.9	22.4	2.5	0.25	5.02	0.014	0.989	Soil Volume Translocated (m3)	= 0.020
10	T	17.25	15.14		33.21	29.16	0.139	10.011	43.4	50.8	231.3	35.0	3.50					
	B	21.47	18.12	33.26	38.22	32.26	0.185	10.016	22.7	5.3	24.0	4.4	0.44	3.94	0.011	1.000	Soil Mass Translocated (kg)	= 22.8
Totals				290.1										350.52	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
4 11	1 T	19.93	18.49		38.81	36.02	0.078	10.019	361.0	319.1	1451.7	268.4	26.84					
	B	21.16	19.10	37.59	41.24	37.24	0.107	10.014	169.8	815.5	3711.6	709.1	70.91	97.75	0.310	0.310	Bulk Density at to (kg/m3)	= 1135
	2 T	15.51	14.37		42.07	38.99	0.079	10.012	86.5	439.1	1998.8	287.2	28.72					
	B	12.57	11.30	25.66	43.29	38.92	0.112	10.018	130.0	641.9	2920.6	329.9	32.99	61.71	0.196	0.196	Cl Added to Plot (g)	= 475
	3 T	18.77	17.20		40.74	37.34	0.091	10.019	367.1	324.1	1474.4	253.6	25.36					
	B	17.70	15.67	32.87	40.87	36.20	0.129	10.018	179.8	171.3	779.4	122.1	12.21	37.57	0.119	0.625	Baseline Cl Recovered (g)	= 4.66
	4 T	19.57	17.93		39.79	36.48	0.091	10.013	257.0	235.0	1069.8	191.9	19.19					
	B	16.97	15.06	33.00	39.49	35.07	0.126	10.015	30.5	21.9	99.6	15.0	1.50	20.69	0.066	0.691	Total Cl Measured at ti (g)	= 315.1
	5 T	17.26	15.87		36.71	33.75	0.088	10.019	69.5	348.4	1585.2	251.5	25.15					
	B	22.49	19.91	35.77	44.70	39.57	0.130	10.010	27.4	18.1	82.4	16.4	1.64	26.79	0.085	0.776	Added Cl Recovered at ti (g)	= 315.1
	6 T	14.60	13.37		38.97	35.71	0.091	10.007	253.9	232.5	1059.1	141.7	14.17					
	B	16.42	14.61	27.99	40.42	35.99	0.123	10.015	24.6	11.4	51.7	7.6	0.76	14.92	0.047	0.823	Cl Recovery Ratio	= 0.670
	7 T	17.10	15.79		40.34	37.25	0.083	10.014	319.5	284.8	1296.2	204.7	20.47					
	B	19.73	17.60	33.39	37.32	33.29	0.121	10.015	25.2	12.7	58.0	10.2	1.02	21.49	0.068	0.891	Cl Translocated from Plot (g)	= 159.5
	8 T	14.34	13.30		36.62	33.97	0.078	10.017	207.1	194.1	883.4	117.5	11.75					
	B	19.74	17.66	30.96	40.60	36.33	0.118	10.012	26.1	15.1	68.6	12.1	1.21	12.96	0.041	0.933	Cl Not Translocated (g)	= 155.7
	9 T	17.98	16.71		41.03	38.15	0.075	10.020	133.2	131.7	599.0	100.1	10.01					
	B	22.79	20.44	37.15	41.31	37.05	0.115	10.019	22.6	7.0	31.8	6.5	0.65	10.66	0.036	0.966	Soil Volume Translocated (m3)	= 0.030
	10 T	14.36	13.43		38.34	35.88	0.069	10.010	169.8	163.1	742.6	99.7	9.97					
	B	14.98	13.53	26.96	36.73	33.19	0.107	10.009	24.0	10.1	45.8	6.2	0.62	10.59	0.034	1.000	Soil Mass Translocated (kg)	= 34.1
Totals				321.3										315.13	1.000			
		(extracted 10 91, analysed 05 12 91)																
4 12	1 T	17.81	16.04		35.68	32.15	0.110	10.014	175.5	187.5	853.5	136.9	13.69					
	B	23.42	20.41	36.45	39.25	34.21	0.147	10.014	209.1	419.6	1909.7	389.7	38.97	52.66	0.291	0.291	Bulk Density at to (kg/m3)	= 1132
	2 T	17.91	16.06		33.93	30.43	0.115	10.020	298.6	292.4	1330.3	213.6	21.36					
	B	21.10	18.33	34.39	38.83	33.75	0.151	10.015	408.5	408.3	1858.1	340.7	34.07	55.43	0.307	0.598	Cl Added to Plot (g)	= 475
	3 T	17.83	15.92		36.15	32.28	0.120	10.016	131.1	148.2	674.6	107.4	10.74					
	B	16.11	14.06	29.97	35.03	30.57	0.146	10.023	198.0	206.4	938.5	131.9	13.19	23.93	0.132	0.731	Baseline Cl Recovered (g)	= 0
	4 T	16.93	15.29		28.54	25.78	0.107	10.005	136.6	153.4	698.9	106.8	10.68					
	B	17.84	15.52	30.81	43.33	37.72	0.149	10.014	33.4	31.1	141.5	22.0	2.20	12.88	0.071	0.802	Total Cl Measured at ti (g)	= 180.7
	5 T	16.28	14.63		39.15	35.18	0.113	10.020	73.2	87.0	395.8	57.9	5.79					
	B	19.60	17.19	31.82	35.51	31.15	0.140	10.008	25.7	17.9	81.5	14.0	1.40	7.19	0.040	0.842	Added Cl Recovered at ti (g)	= 180.7
	6 T	15.33	13.76		32.90	29.55	0.114	10.019	23.5	10.2	46.3	6.4	0.64					
	B	15.15	13.25	27.01	34.79	30.43	0.143	10.019	102.0	119.5	543.7	72.0	7.20	7.84	0.043	0.885	Cl Recovery Ratio	= 0.380
	7 T	18.46	16.51		37.56	33.59	0.118	10.017	54.5	64.0	291.2	48.1	4.81					
	B	20.37	17.76	34.27	43.81	38.20	0.147	10.016	21.3	3.8	17.3	3.1	0.31	5.11	0.028	0.913	Cl Translocated from Plot (g)	= 108.1
	8 T	16.48	14.82		36.01	32.39	0.112	10.015	59.6	70.3	319.7	47.4	4.74					
	B	15.87	13.79	28.61	36.48	31.71	0.151	10.011	22.3	6.5	29.5	4.1	0.41	5.14	0.028	0.942	Cl Not Translocated (g)	= 72.6
	9 T	14.01	12.60		37.81	34.03	0.111	10.019	82.7	99.0	450.6	56.8	5.68					
	B	17.17	14.94	27.54	40.86	35.57	0.149	10.005	22.5	7.2	32.7	4.9	0.49	6.17	0.034	0.976	Soil Volume Translocated (m3)	= 0.019
	10 T	16.05	14.50		36.57	33.05	0.106	10.020	48.1	56.2	255.6	37.1	3.71					
	B	20.45	17.94	32.44	33.67	29.55	0.140	10.019	22.6	7.6	34.6	6.2	0.62	4.33	0.024	1.000	Soil Mass Translocated (kg)	= 21.9
Totals				313.3										180.68	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot Sample	Field Estimates Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
(extracted 10 91, analysed 05 12 91)																	
4 7x 1 L	27.49			39.68	38.14	0.040	10.009	207.7	1040.6	4739.0	1302.5	******					
R	28.41	55.90		40.88	38.65	0.058	10.017	323.7	623.5	2837.3	806.1	80.61	210.87	0.363	0.363	Bulk Density at to (kg/m3)	= 1203
2 L	28.05			38.49	36.89	0.043	10.009	344.2	[illegible]	3078.1	863.4	86.34					
R	31.10	59.15		36.25	34.26	0.058	10.009	270.1	[illegible]	2376.9	739.2	73.92	160.26	0.276	0.639	Cl Added to Plot (g)	= 475
3 L	25.53			38.38	36.99	0.038	10.018	79.5	95.6	435.0	111.1	11.11					
R	31.55	57.08		39.64	37.10	0.069	10.010	43.3	50.7	230.9	72.9	7.29	18.39	0.032	0.670	Baseline Cl Recovered (g)	= 5.07
4 L	25.48			40.53	39.32	0.031	10.011	22.8	7.9	35.8	9.1	0.91					
R	30.80	56.28		35.23	33.08	0.065	10.008	59.8	70.9	322.9	99.5	9.95	10.86	0.019	0.689	Total Cl Measured at ti (g)	= 581.0
5 L	25.26			39.03	37.47	0.042	10.019	89.7	107.2	487.7	123.2	12.32					
R	32.50	57.76		35.74	33.51	0.067	10.009	21.4	4.5	20.4	6.6	0.66	12.99	0.022	0.711	Added Cl Recovered at ti (g)	= 581.0
6 L	25.40			39.39	38.05	0.035	10.017	199.4	207.6	944.5	221.0	22.10					
R	28.70	52.10		39.27	36.75	0.069	10.009	30.1	25.0	113.7	32.6	3.26	25.37	0.044	0.755	Cl Recovery Ratio	= 1.236
7 L	24.77			42.17	40.74	0.035	10.018	225.1	230.4	1048.5	259.7	25.97					
R	31.19	55.97		35.39	32.90	0.076	10.013	32.1	28.3	128.9	40.2	4.02	29.99	0.052	0.807	Cl Translocated from Plot (g)	= 371.1
8 L	25.95			43.02	41.21	0.044	10.019	307.9	298.1	1356.2	324.8	32.48					
R	31.44	55.39		35.12	32.46	0.082	10.020	28.7	22.7	103.4	32.5	3.25	35.73	0.061	0.868	Cl Not Translocated (g)	= 209.9
9 L	25.05			35.70	34.34	0.040	10.019	294.2	287.5	1308.1	327.7	32.77					
R	26.01	51.06		36.69	34.02	0.078	10.008	34.0	31.8	144.6	37.6	3.76	36.53	0.063	0.931	Soil Volume Translocated (m3)	= 0.026
10 L	26.16			40.65	38.54	0.055	10.006	49.7	58.5	266.5	69.7	6.97					
R	29.81	55.97		39.91	36.54	0.092	10.020	240.3	243.6	1107.9	330.3	33.03	40.00	0.069	1.000	Soil Mass Translocated (kg)	= 31.5
Totals		556.7											580.98	1.000			

	---Soil Probe Depths--- L(cm)	L(cm)	R(cm)	R(cm)	Volume (cm3)	Area (cm2)	Mass (kg)	BD (kg/m3)
4 7x 1	21	21	21	21	332.6	15.84	0.4354	1309
					332.6	15.84	0.4500	1353
2	23	25	22	20	380.2	15.84	0.4443	1169
					332.6	15.84	0.4926	1481
3	21	20	21	20	324.7	15.84	0.4044	1245
					324.7	15.84	0.4997	1539
4	21	19	20	18	316.8	15.84	0.4036	1274
					301.0	15.84	0.4879	1621
5	21	21	21	19	332.6	15.84	0.4002	1203
					316.8	15.84	0.5148	1625
6	20	18	19	19	301.0	15.84	0.3707	1232
					301.0	15.84	0.4547	1511
7	21	20	21	19	324.7	15.84	0.3924	1208
					316.8	15.84	0.4941	1560
8	21	21	18	20	332.6	15.84	0.3793	1140
					301.0	15.84	0.4981	1655
9	21	21	20	19	332.6	15.84	0.3968	1193
					308.9	15.84	0.4120	1334
10	19	20	19	19	308.9	15.84	0.4144	1342
					301.0	15.84	0.4722	1569

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
4 9x	1 T	15.77	13.68		37.92	32.91	0.152	10.012	279.5	243.5	1108.4	151.6	15.16					
	B	11.33	10.06	23.74	41.98	37.29	0.126	10.009	223.3	1042.5	4747.5	477.6	47.76	62.93	0.193	0.193	Bulk Density at to (kg/m3)	= 1141
	2 T	15.96	14.27		37.88	33.88	0.118	10.014	80.3	393.3	1790.1	255.5	25.55					
	B	19.04	16.98	31.25	35.97	32.09	0.121	10.017	270.4	1220.5	5553.7	943.1	94.31	119.86	0.368	0.561	Cl Added to Plot (g)	= 475
	3 T	14.14	12.51		33.85	29.96	0.130	10.020	129.3	643.0	2924.8	365.9	36.59					
	B	15.65	13.95	26.46	36.35	32.41	0.121	10.013	228.9	203.9	928.1	129.5	12.95	49.54	0.152	0.713	Baseline Cl Recovered (g)	= 0
	4 T	19.53	17.43		35.09	31.32	0.120	10.020	157.1	146.6	667.0	116.2	11.62					
	B	16.99	14.96	32.38	33.65	29.63	0.136	10.012	103.2	100.5	457.6	68.4	6.84	18.47	0.057	0.769	Total Cl Measured at ti (g)	= 326.1
	5 T	15.88	14.23		39.44	35.35	0.116	10.014	278.3	242.6	1104.0	157.1	15.71					
	B	16.02	14.06	28.29	35.86	31.48	0.139	10.015	21.5	14.1	64.1	9.0	0.90	16.61	0.051	0.820	Added Cl Recovered at ti (g)	= 326.1
	6 T	16.57	14.79		36.24	32.35	0.120	10.020	255.0	224.6	1021.5	151.1	15.11					
	B	16.78	14.70	29.49	38.37	33.62	0.141	10.009	14.2	3.6	16.4	2.4	0.24	15.35	0.047	0.867	Cl Recovery Ratio	= 0.686
	7 T	15.14	13.57		31.47	28.21	0.115	10.020	247.7	218.8	995.4	135.1	13.51					
	B	14.75	12.90	26.47	37.25	32.58	0.143	10.020	17.6	7.7	35.2	4.5	0.45	13.96	0.043	0.910	Cl Translocated from Plot (g)	= 182.8
	8 T	13.63	12.23		30.43	27.31	0.114	10.020	211.9	190.1	864.9	105.8	10.58					
	B	13.97	12.25	24.48	35.57	31.20	0.140	10.020	19.6	10.8	49.0	6.0	0.60	11.18	0.034	0.944	Cl Not Translocated (g)	= 143.3
	9 T	14.79	13.31		38.36	34.52	0.111	10.011	167.4	155.0	705.5	93.9	9.39					
	B	15.43	13.48	26.78	35.44	30.97	0.145	10.014	13.9	3.3	15.2	2.1	0.21	9.59	0.029	0.974	Soil Volume Translocated (m3)	= 0.021
	10 T	13.87	12.52		33.84	30.56	0.107	10.016	148.1	139.2	633.6	79.3	7.93					
	B	15.57	13.67	26.19	35.61	31.29	0.138	10.005	19.3	10.3	46.9	6.4	0.64	8.57	0.026	1.000	Soil Mass Translocated (kg)	= 24.5
Totals				275.5										326.05	1.000			
		(extracted 10 91, analysed 03 06 92)																
4 10x	1 T	16.90	14.97		34.25	30.35	0.129	10.015	301.6	267.9	1219.1	182.5	18.25					
	B	15.47	13.44	28.41	36.19	31.46	0.150	10.017	178.1	850.3	3869.0	520.1	52.01	70.26	0.206	0.206	Bulk Density at to (kg/m3)	= 1147
	2 T	15.79	13.99		37.76	33.46	0.129	10.019	111.7	558.5	2540.8	355.4	35.54					
	B	13.79	12.02	26.01	36.43	31.78	0.147	10.009	256.6	1161.6	5290.0	636.0	63.60	99.14	0.291	0.497	Cl Added to Plot (g)	= 475
	3 T	18.32	16.18		36.55	32.29	0.132	10.012	133.0	655.4	2983.6	482.8	48.28					
	B	20.39	17.60	33.78	37.73	32.58	0.158	10.010	81.6	413.0	1880.3	331.0	33.10	81.38	0.239	0.735	Baseline Cl Recovered (g)	= 5.22
	4 T	17.07	15.12		29.87	26.48	0.128	10.020	80.9	408.9	1860.3	281.3	28.13					
	B	17.49	15.01	30.13	31.34	26.90	0.165	10.009	50.0	40.6	185.1	27.8	2.78	30.91	0.091	0.826	Total Cl Measured at ti (g)	= 341.0
	5 T	16.56	14.55		29.49	25.92	0.138	10.021	307.4	272.8	1241.0	180.6	18.06					
	B	16.18	13.84	28.39	31.19	26.68	0.169	10.012	38.3	28.6	130.0	18.0	1.80	19.86	0.058	0.884	Added Cl Recovered at ti (g)	= 341.0
	6 T	16.94	14.97		31.05	27.45	0.131	10.016	256.9	234.3	1066.1	159.6	15.96					
	B	18.54	15.88	30.85	36.92	31.64	0.167	10.012	23.7	11.4	52.0	8.3	0.83	16.78	0.049	0.934	Cl Recovery Ratio	= 0.726
	7 T	15.48	13.60		33.29	29.25	0.138	10.008	140.5	138.2	629.3	85.6	8.56					
	B	13.77	11.75	25.35	35.11	29.98	0.171	10.017	21.0	6.0	27.1	3.2	0.32	8.88	0.026	0.960	Cl Translocated from Plot (g)	= 169.4
	8 T	16.60	14.64		32.67	28.82	0.133	10.015	89.1	91.0	414.0	60.6	6.06					
	B	15.39	13.12	27.76	35.01	29.86	0.172	10.009	21.6	7.0	32.0	4.2	0.42	6.48	0.019	0.979	Cl Not Translocated (g)	= 171.6
	9 T	17.19	15.08		29.10	25.53	0.140	10.015	65.0	58.3	265.2	40.0	4.00					
	B	13.02	11.07	26.14	27.72	23.57	0.176	10.009	19.4	3.2	14.5	1.6	0.16	4.16	0.012	0.991	Soil Volume Translocated (m3)	= 0.019
	10 T	17.25	15.14		33.21	29.16	0.139	10.011	49.4	40.0	182.3	27.6	2.76					
	B	21.47	18.12	33.26	38.22	32.26	0.185	10.016	20.2	4.4	19.9	3.6	0.36	3.12	0.009	1.000	Soil Mass Translocated (kg)	= 21.9
Totals				290.1										340.97	1.000			

SECONDARY TILLAGE OPERATIONS 1991 (C-Tine Cultivator - N to S)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 04 06 92)																
4 12x 1	T	17.81	16.04		35.68	32.15	0.110	10.014	174.5	160.6	731.0	117.2	11.72					
	B	23.42	20.41	36.45	39.25	34.21	0.147	10.014	79.7	389.3	1771.7	361.5	36.15	47.88	0.292	0.292	Bulk Density at to (kg/m3)	= 1132
2	T	17.91	16.06		33.93	30.43	0.115	10.020	323.5	279.9	1273.3	204.5	20.45					
	B	21.10	18.33	34.39	38.83	33.75	0.151	10.015	75.4	359.0	1634.0	299.6	29.96	50.40	0.307	0.599	Cl Added to Plot (g)	= 475
3	T	17.83	15.92		36.15	32.28	0.120	10.016	141.8	134.0	609.7	97.0	9.70					
	B	16.11	14.06	29.97	35.03	30.57	0.146	10.023	219.9	196.6	894.2	125.7	12.57	22.27	0.136	0.735	Baseline Cl Recovered (g)	= 0
4	T	16.93	15.29		28.54	25.78	0.107	10.005	159.9	148.9	678.4	103.7	10.37					
	B	17.84	15.52	30.81	43.33	37.72	0.149	10.014	30.6	23.7	107.8	16.7	1.67	12.04	0.073	0.808	Total Cl Measured at ti (g)	= 164.0
5	T	16.28	14.63		39.15	35.18	0.113	10.020	83.6	79.8	363.0	53.1	5.31					
	B	19.60	17.19	31.82	35.51	31.15	0.140	10.008	19.0	9.8	44.7	7.7	0.77	6.08	0.037	0.845	Added Cl Recovered at ti (g)	= 164.0
6	T	15.33	13.76		32.90	29.55	0.114	10.019	15.9	5.5	25.1	3.5	0.35					
	B	15.15	13.25	27.01	34.79	30.43	0.143	10.019	113.5	109.7	498.9	66.1	6.61	6.95	0.042	0.888	Cl Recovery Ratio	= 0.345
7	T	18.46	16.51		37.56	33.59	0.118	10.017	67.4	59.9	272.4	45.0	4.50					
	B	20.37	17.76	34.27	43.81	38.20	0.147	10.016	12.8	2.3	10.3	1.8	0.18	4.68	0.029	0.916	Cl Translocated from Plot (g)	= 98.3
8	T	16.48	14.82		36.01	32.39	0.112	10.015	71.7	65.0	295.7	43.8	4.38					
	B	15.87	13.79	28.61	36.48	31.71	0.151	10.011	13.7	3.1	14.0	1.9	0.19	4.57	0.028	0.944	Cl Not Translocated (g)	= 65.7
9	T	14.01	12.60		37.81	34.03	0.111	10.019	100.3	97.9	445.4	56.1	5.61					
	B	17.17	14.94	27.54	40.86	35.57	0.149	10.005	14.3	3.7	16.8	2.5	0.25	5.86	0.036	0.980	Soil Volume Translocated (m3)	= 0.019
10	T	16.05	14.50		36.57	33.05	0.106	10.020	54.7	45.8	208.2	30.2	3.02					
	B	20.45	17.94	32.44	33.67	29.55	0.140	10.019	13.7	3.1	13.9	2.5	0.25	3.27	0.020	1.000	Soil Mass Translocated (kg)	= 21.5
Totals				313.3										164.02	1.000			
		(extracted 10 91, analysed 05 12 91)																
4 1	1	13.58	11.71		32.15	27.74	0.159	10.017	192.3	979.4	4456.6							
	2	15.66	14.06		36.95	33.17	0.114	10.012	301.3	592.0	2694.9							
		20.84	17.78		36.06	30.77	0.172	10.019	174.7	859.3	3909.4							
	3	19.50	17.27		29.24	25.90	0.129	10.013	210.8	410.5	1868.6							
	6	15.10	13.23		38.42	33.67	0.141	10.011	324.2	315.2	1435.3							
4 2	1	14.24	12.97		32.47	29.59	0.097	10.009	191.5	396.2	1804.3							
		13.09	11.35	24.33	33.47	29.04	0.153	10.017	235.4	1167.6	5312.8							
	2	18.44	16.56		35.63	32.01	0.113	10.017	291.5	597.6	2719.4							
		18.96	16.36	32.92	35.96	31.04	0.159	10.017	273.7	1252.4	5698.6							
	3	16.81	14.84		33.85	29.89	0.132	10.010	377.6	374.4	1704.6							
		16.94	14.40	29.24	40.38	34.34	0.176	10.017	168.5	181.7	826.7							
	4	15.01	13.18		31.32	27.51	0.138	10.018	314.0	306.1	1392.8							
		11.88	9.99	23.17	33.92	28.54	0.188	10.009	32.9	30.4	138.2							
	5	16.52	14.47		36.17	31.69	0.142	10.017	22.8	8.0	36.4							
		18.55	15.77	30.24	33.33	28.35	0.176	10.018	32.9	30.4	138.1							
	6	19.37	16.97		39.25	34.40	0.141	10.019	309.8	301.7	1372.5							
		19.16	16.15	33.12	38.54	32.50	0.186	10.016	20.6	2.1	9.7							
		14.84	12.61		35.97	30.58	0.176	10.020	25.0	15.2	69.2							
4 7x	1	20.38	19.65		33.02	31.85	0.037	10.015	114.5	620.1	2822.1							
		20.08	19.27	38.93	33.58	32.24	0.042	10.020	126.0	677.7	3082.9							
	2	16.30	15.74		30.42	29.38	0.036	10.009	98.5	547.0	2490.9							
1		20.84	19.93	35.67	31.73	30.36	0.045	10.020	139.9	753.8	3429.0							

APPENDIX D

Experimental Data Including Soil Bulk Density, Soil Moisture Content, Chloride Content, Pulse Response Distributions, and Soil Translocation Calculations from Ground Speed Experiments

Soil samples were collected in the field for the determination of soil bulk density, gravimetric soil moisture content, and soil chloride content. This data was utilized to generate pulse response distributions (PRD) and synthetic step response distributions (SSRD) to calculate soil volume translocation and soil mass translocation (see Section 4.3). The method of sample collection and analysis is given in Section 3 entitled "Materials and Methods". Manual field measurements of tillage depth and till layer depth were also conducted. The field samples and measurements for the secondary tillage implements were collected at the end of the 1991 field season. Laboratory analysis of chloride content was conducted with the 1991 samples of the tillage implement experiments. The discussion of the TRAACS in Appendix C applies to this data as well.

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
1 1	1 T	22.09	19.94		35.25	31.82	0.108	10.018	86.6	414.0	1883.6	375.5	37.55					
	B	18.78	17.13	37.06	38.26	34.90	0.096	10.011	55.3	51.7	235.2	40.3	4.03	41.58	0.114	0.114	Bulk Density at to (kg/m3)	= 1619
	2 T	21.25	19.36		34.75	31.66	0.098	10.020	54.8	51.2	233.0	45.1	4.51					
	B	18.47	16.98	36.34	32.05	29.47	0.088	10.015	16.9	0.0	0.0	0.0	0.00	4.51	0.012	0.127	Background Cl (g/m2)	= 0
	3 T	21.53	19.59		36.10	32.84	0.099	10.015	92.6	441.4	2009.0	393.5	39.35					
	B	21.70	19.97	39.56	36.82	33.90	0.086	10.017	147.6	677.6	3083.4	615.9	61.59	100.94	0.278	0.405	Cl Added to Plot (g)	= 475
	4 T	18.99	17.27		34.35	31.24	0.100	10.014	109.3	515.2	2345.0	404.9	40.49					
	B	15.53	14.26	31.53	27.58	25.33	0.089	10.016	111.0	522.6	2378.2	339.1	33.91	74.40	0.205	0.609	Total Cl Measured at ti (g)	= 363.4
	5 T	22.22	20.29		31.37	28.65	0.095	10.020	92.4	440.3	2002.9	406.4	40.64					
	B	20.11	18.41	38.70	32.63	29.88	0.092	10.013	324.2	267.5	1217.7	224.2	22.42	63.06	0.174	0.783	Added Cl Recovered at ti (g)	= 363.4
	6 T	17.95	16.37		39.93	36.43	0.096	10.004	399.1	332.7	1515.9	248.2	24.82					
	B	14.86	13.57	29.94	37.79	34.51	0.095	10.019	295.4	245.0	1114.7	151.2	15.12	39.94	0.110	0.893	Cl Recovery Ratio	= 0.765
	7 T	21.57	19.63		34.29	31.21	0.099	10.011	213.9	187.6	854.2	167.7	16.77					
	B	26.41	23.94	43.57	39.20	35.55	0.103	10.010	102.6	97.2	442.4	105.9	10.59	27.36	0.075	0.968	Cl Translocated from Plot (g)	= 317.3
	8 T	18.76	16.92		40.34	36.40	0.108	10.020	60.1	56.4	256.6	43.4	4.34					
	B	16.96	15.28	32.21	34.58	31.17	0.109	10.013	43.7	39.6	180.5	27.6	2.76	7.10	0.020	0.987	Cl Not Translocated (g)	= 46.1
	9 T	17.09	15.41		37.47	33.80	0.109	10.020	24.5	14.3	65.1	10.0	1.00					
	B	16.81	15.10	30.51	36.17	32.50	0.113	10.020	38.4	32.1	145.8	22.0	2.20	3.20	0.009	0.996	Soil Volume Translocated (m3)	= 0.035
	10 T	17.22	15.46		33.68	30.25	0.114	10.017	23.2	11.1	50.7	7.8	0.78					
	B	16.06	14.37	29.83	34.29	30.69	0.117	10.022	22.0	8.5	38.7	5.6	0.56	1.34	0.004	1.000	Soil Mass Translocated (kg)	= 56.0
Totals				349.2										363.43	1.000			
		(extracted 10 91, analysed 10 12 91)																
1 2	1 T	13.80	12.61		35.90	32.80	0.094	10.018	15.9	0.0	0.0	0.0	0.00					
	B	15.01	13.89	26.49	35.75	33.08	0.081	10.014	54.5	59.3	270.1	37.5	3.75	3.75	0.009	0.009	Bulk Density at to (kg/m3)	= 1619
	2 T	23.81	21.66		29.90	27.21	0.099	10.015	51.0	54.9	249.9	54.1	5.41					
	B	23.13	21.20	42.87	33.48	30.70	0.091	10.009	188.5	586.1	2668.8	565.9	56.59	62.00	0.153	0.163	Background Cl (g/m2)	= 0
	3 T	21.48	19.71		40.50	37.17	0.090	10.010	187.0	572.9	2608.7	514.1	51.41					
	B	21.92	20.34	40.05	36.42	33.81	0.077	10.019	148.0	464.0	2111.1	429.5	42.95	94.36	0.233	0.396	Cl Added to Plot (g)	= 475
	4 T	22.60	20.85		38.37	35.40	0.084	10.017	223.5	664.6	3023.9	630.3	63.03					
	B	24.80	23.45	44.30	40.82	38.61	0.057	10.012	278.7	274.6	1250.2	293.2	29.32	92.36	0.228	0.624	Total Cl Measured at ti (g)	= 404.4
	5 T	24.17	22.21		39.51	36.32	0.088	10.017	158.0	505.0	2297.7	510.4	51.04					
	B	19.74	18.36	40.58	35.89	33.40	0.075	10.020	307.5	297.7	1354.3	248.7	24.87	75.91	0.188	0.812	Added Cl Recovered at ti (g)	= 404.4
	6 T	23.99	22.26		35.33	32.78	0.078	10.015	208.9	214.5	976.2	217.3	21.73					
	B	23.47	21.71	43.96	34.33	31.76	0.081	10.005	179.0	189.1	861.3	187.0	18.70	40.42	0.100	0.912	Cl Recovery Ratio	= 0.851
	7 T	21.64	19.66		39.03	35.47	0.100	10.015	100.4	116.7	531.3	104.5	10.45					
	B	22.13	20.01	39.67	31.29	28.30	0.106	10.012	76.8	76.8	349.7	70.0	7.00	17.44	0.043	0.955	Cl Translocated from Plot (g)	= 65.8
	8 T	21.16	19.25		35.63	32.43	0.099	10.022	65.7	74.8	340.0	65.5	6.55					
	B	15.87	14.27	33.53	32.81	29.53	0.111	10.019	70.8	81.9	372.6	53.2	5.32	11.87	0.029	0.984	Cl Not Translocated (g)	= 338.7
	9 T	20.66	18.78		30.30	27.56	0.100	10.016	28.5	23.7	107.8	20.2	2.02					
	B	16.72	15.07	33.85	30.74	27.72	0.109	10.016	40.2	43.6	198.2	29.9	2.99	5.01	0.012	0.997	Soil Volume Translocated (m3)	= 0.033
	10 T	23.74	21.47		32.84	29.70	0.106	10.009	21.5	8.1	36.7	7.9	0.79					
	B	21.04	18.59	40.06	33.02	29.18	0.131	10.012	20.6	5.8	26.3	4.9	0.49	1.28	0.003	1.000	Soil Mass Translocated (kg)	= 53.3
Totals				385.4										404.41	1.000			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 10 12 91)																
1 3	1 T	16.18	14.57		38.07	34.30	0.110	10.006	18.4	1.0	4.6	0.7	0.07					
	B	19.09	17.01	31.58	30.32	27.03	0.122	10.015	136.7	152.6	694.6	118.2	11.82	11.88	0.038	0.038	Bulk Density at to (kg/m3)	= 1619
	2 T	18.62	16.74		40.70	36.59	0.112	10.005	170.0	528.1	2405.7	402.7	40.27					
	B	20.34	18.27	35.01	38.81	34.86	0.113	10.020	331.2	915.6	4165.1	760.9	76.09	116.36	0.376	0.415	Background Cl (g/m2)	= 0
	3 T	18.70	16.87		35.48	32.01	0.108	10.020	239.8	719.1	3271.1	551.7	55.17					
	B	16.47	14.86	31.73	40.89	36.92	0.108	10.019	360.7	356.4	1621.2	241.0	24.10	79.27	0.256	0.671	Cl Added to Plot (g)	= 475
	4 T	20.41	18.39		38.84	35.01	0.109	10.009	173.9	541.6	2466.4	453.7	45.37					
	B	20.96	18.94	37.34	31.90	28.84	0.106	10.016	114.7	131.7	599.2	113.5	11.35	56.72	0.183	0.854	Total Cl Measured at ti (g)	= 309.3
	5 T	23.25	20.90		38.92	34.99	0.112	10.012	230.1	233.4	1062.4	222.0	22.20					
	B	20.97	18.73	39.62	39.71	35.48	0.119	10.018	62.3	69.6	316.8	59.3	5.93	28.13	0.091	0.945	Added Cl Recovered at ti (g)	= 309.3
	6 T	20.51	18.37		38.09	34.12	0.116	10.025	60.3	67.0	304.5	55.9	5.59					
	B	17.00	15.18	33.54	38.45	34.34	0.120	10.020	29.1	24.8	113.0	17.1	1.71	7.31	0.024	0.969	Cl Recovery Ratio	= 0.651
	7 T	21.56	19.28		36.71	32.82	0.118	10.018	53.4	57.9	263.6	50.8	5.08					
	B	19.72	17.48	36.75	38.84	34.43	0.128	10.010	23.2	14.1	64.4	11.3	1.13	6.21	0.020	0.989	Cl Translocated from Plot (g)	= 128.2
	8 T	21.14	18.99		36.02	32.36	0.113	10.010	19.8	4.3	19.7	3.7	0.37					
	B	21.86	19.53	38.52	32.30	28.87	0.119	10.005	34.7	31.9	145.4	28.4	2.84	3.21	0.010	0.999	Cl Not Translocated (g)	= 181.1
	9 T	19.22	17.37		38.74	35.01	0.107	10.019	18.7	1.7	7.8	1.4	0.14					
	B	17.93	16.02	33.39	38.68	34.57	0.119	10.020	18.4	1.0	4.5	0.7	0.07	0.21	0.001	1.000	Soil Volume Translocated (m3)	= 0.019
	10 T	22.70	20.36		38.53	34.57	0.115	10.009	16.8	0.0	0.0	0.0	0.00					
	B	22.38	20.37	40.73	32.63	29.71	0.098	10.010	17.1	0.0	0.0	0.0	0.00	0.00	0.000	1.000	Soil Mass Translocated (kg)	= 30.9
Totals				358.2										309.29	1.000			
		(extracted 10 91, analysed 13 12 91)																
2 1	1 T	19.76	17.81		43.72	39.41	0.109	10.012	19.1	0.0	0.0	0.0	0.00					
	B	14.73	13.13	30.94	36.59	32.62	0.121	10.014	34.3	32.9	149.6	19.6	1.96	1.96	0.005	0.005	Bulk Density at to (kg/m3)	= 1619
	2 T	21.40	19.24		41.67	37.47	0.112	10.015	51.4	59.5	270.8	52.1	5.21					
	B	16.97	15.17	34.41	34.50	30.86	0.118	10.010	432.0	432.5	1969.2	298.8	29.88	35.08	0.094	0.099	Background Cl (g/m2)	= 0
	3 T	19.76	17.77		37.72	33.94	0.112	10.016	279.9	278.0	1265.0	224.8	22.48					
	B	17.76	15.98	33.75	36.33	32.69	0.111	10.006	411.9	815.4	3714.4	593.5	59.35	81.84	0.218	0.317	Cl Added to Plot (g)	= 475
	4 T	23.56	21.27		35.73	32.26	0.108	10.010	399.0	775.3	3530.5	750.8	75.08					
	B	16.76	15.06	36.33	40.85	36.72	0.112	10.017	309.6	610.6	2778.5	418.5	41.85	116.94	0.312	0.629	Total Cl Measured at ti (g)	= 375.1
	5 T	19.94	17.96		39.54	35.62	0.110	10.009	249.2	506.9	2308.4	414.6	41.46					
	B	20.74	18.48	36.44	37.55	33.47	0.122	10.014	284.4	281.8	1282.5	237.1	23.71	65.16	0.174	0.802	Added Cl Recovered at ti (g)	= 375.1
	6 T	20.43	18.36		32.44	29.16	0.112	10.010	282.7	280.3	1276.5	234.4	23.44					
	B	19.68	17.58	35.94	35.65	31.85	0.119	10.008	262.7	263.3	1199.1	210.8	21.08	44.51	0.119	0.921	Cl Recovery Ratio	= 0.790
	7 T	20.70	18.51		40.55	36.28	0.118	10.011	112.7	129.2	588.1	54.4	10.89					
	B	24.28	21.59	40.11	37.16	33.05	0.124	10.015	45.2	52.2	237.6	22.0	5.13	16.02	0.043	0.964	Cl Translocated from Plot (g)	= 37.0
	8 T	18.05	16.20		37.34	33.52	0.114	10.010	54.6	63.4	288.6	23.4	4.68					
	B	15.39	13.67	29.87	39.11	34.76	0.125	10.010	38.2	39.8	181.3	14.7	2.48	7.16	0.019	0.983	Cl Not Translocated (g)	= 338.0
	9 T	19.99	17.87		42.75	38.23	0.118	10.007	36.4	36.5	166.2	14.8	2.97					
	B	18.84	16.78	34.65	40.11	35.73	0.123	10.012	27.1	21.7	98.7	8.8	1.66	4.62	0.012	0.995	Soil Volume Translocated (m3)	= 0.034
	10 T	25.94	23.19		37.86	33.85	0.119	10.020	23.2	10.3	46.7	5.4	1.08					
	B	24.76	22.08	45.26	40.98	36.55	0.121	10.014	22.2	7.1	32.4	3.8	0.72	1.80	0.005	1.000	Soil Mass Translocated (kg)	= 55.4
Totals				357.7										375.10	1.000			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
	(extracted 10 91, analysed 04 06 92)																
2 2 1 T	24.36	21.66		33.91	30.16	0.124	10.012	13.7	1.5	6.7	1.5	0.15					
B	25.05	22.09	43.76	35.66	31.46	0.134	10.010	28.5	0.0	0.0	0.0	0.00	0.15	0.000	0.000	Bulk Density at to (kg/m3)	= 1619
2 T	19.01	16.69		36.38	31.95	0.139	10.017	19.4	8.5	38.7	6.5	0.65					
B	18.92	16.76	33.45	36.18	32.06	0.128	10.012	199.6	172.0	783.2	131.3	13.13	13.77	0.033	0.033	Background Cl (g/m2)	= 0
3 T	21.83	19.39		40.46	35.95	0.125	10.020	419.0	349.1	1588.2	308.0	30.80					
B	22.90	20.41	39.80	38.18	34.03	0.122	10.020	173.4	761.7	3465.0	707.2	70.72	101.52	0.244	0.277	Cl Added to Plot (g)	= 475
4 T	20.17	17.96		31.09	27.68	0.123	10.015	177.7	778.6	3543.3	636.2	63.62					
B	20.38	18.23	36.18	33.37	29.85	0.118	10.017	111.8	509.6	2318.8	422.6	42.26	105.88	0.254	0.531	Total Cl Measured at ti (g)	= 416.7
5 T	24.61	21.94		38.37	34.22	0.121	10.009	134.2	603.6	2748.9	603.2	60.32					
B	26.03	23.08	45.02	32.45	28.78	0.128	10.011 *		197.0	896.7	207.0	20.70	81.02	0.194	0.726	Added Cl Recovered at ti (g)	= 416.7
6 T	22.53	19.95		34.25	30.33	0.129	10.020	82.6	380.1	1728.9	344.9	34.49					
B	17.07	15.04	34.99	34.20	30.14	0.135	10.016	195.2	168.5	766.7	115.3	11.53	46.02	0.110	0.836	Cl Recovery Ratio	= 0.877
7 T	22.39	19.81		29.72	26.30	0.130	10.016	192.5	166.5	757.5	150.1	15.01					
B	27.86	24.75	44.56	28.62	25.45	0.125	10.018	103.5	95.8	435.7	107.8	10.78	25.79	0.062	0.898	Cl Translocated from Plot (g)	= 13.9
8 T	22.76	20.00		35.77	31.44	0.138	10.007	186.9	162.3	739.4	147.9	14.79					
B	18.91	16.73	36.73	31.79	28.13	0.130	10.020	74.5	69.6	316.7	53.0	5.30	20.09	0.048	0.946	Cl Not Translocated (g)	= 402.8
9 T	22.95	20.27		40.35	35.65	0.132	10.017	92.7	86.5	393.5	79.8	7.98					
B	21.08	18.82	39.09	36.47	32.57	0.120	10.013	57.3	53.6	243.8	45.9	4.59	12.57	0.030	0.976	Soil Volume Translocated (m3)	= 0.041
10 T	20.64	18.23		36.24	32.01	0.132	10.007	67.0	62.6	285.0	51.9	5.19					
B	19.67	17.60	35.82	40.88	36.58	0.117	10.011	62.5	58.4	265.9	46.8	4.68	9.87	0.024	1.000	Soil Mass Translocated (kg)	= 66.9
Totals			389.4										416.68	1.000			
	(extracted 10 91, analysed 13 12 91)																
2 3 1 T	19.43	17.24		35.29	31.31	0.127	10.020	20.2	1.6	7.1	1.2	0.12					
B	18.45	16.40	33.64	35.38	31.46	0.124	10.009	198.1	205.3	935.0	153.4	15.34	15.46	0.038	0.038	Bulk Density at to (kg/m3)	= 1619
2 T	20.86	18.56		33.17	29.52	0.124	10.016	73.1	85.9	390.9	72.6	7.26					
B	21.84	19.53	38.09	37.82	33.83	0.118	10.017	149.9	851.5	3874.4	756.5	75.65	82.91	0.203	0.241	Background Cl (g/m2)	= 0
3 T	16.03	14.35		39.77	35.60	0.117	10.006	397.5	794.6	3619.4	519.2	51.92					
B	20.47	18.36	32.71	39.84	35.74	0.115	10.010	345.0	678.1	3087.5	566.9	56.69	108.62	0.266	0.507	Cl Added to Plot (g)	= 475
4 T	24.11	21.56		38.79	34.69	0.118	10.016	341.9	336.9	1533.0	330.5	33.05					
B	25.14	22.45	44.01	41.58	37.13	0.120	10.020	150.8	817.8	3720.2	835.1	83.51	116.56	0.286	0.793	Total Cl Measured at ti (g)	= 408.1
5 T	23.74	21.07		37.43	33.23	0.126	10.020	374.6	371.2	1688.7	355.9	35.59					
B	18.01	16.12	37.19	30.62	27.42	0.117	10.012	96.1	112.2	510.9	82.4	8.24	43.82	0.107	0.900	Added Cl Recovered at ti (g)	= 408.1
6 T	22.86	20.62		29.11	26.26	0.108	10.008	208.0	214.5	976.9	201.4	20.14					
B	19.50	17.46	38.08	35.63	31.91	0.117	10.013	32.6	30.1	136.9	23.9	2.39	22.53	0.055	0.955	Cl Recovery Ratio	= 0.859
7 T	20.72	18.59		36.82	33.04	0.114	10.005	52.0	60.3	274.8	51.1	5.11					
B	22.47	20.10	38.69	39.52	35.37	0.117	10.009	36.3	36.4	165.7	33.3	3.33	8.44	0.021	0.976	Cl Translocated from Plot (g)	= 98.4
8 T	22.28	20.04		43.60	39.23	0.111	10.020	59.6	69.4	315.7	63.3	6.33					
B	23.31	20.88	40.92	39.09	35.02	0.116	10.016	23.0	9.7	44.0	9.2	0.92	7.25	0.018	0.994	Cl Not Translocated (g)	= 309.7
9 T	22.24	19.87		42.05	37.58	0.119	10.020	24.9	16.6	75.4	15.0	1.50					
B	21.47	19.19	39.06	36.66	32.76	0.118	10.009	22.1	6.9	31.3	6.0	0.60	2.10	0.005	0.999	Soil Volume Translocated (m3)	= 0.025
10 T	22.07	19.76		37.87	33.91	0.117	10.010	21.3	4.5	20.4	4.0	0.40					
B	19.18	17.12	36.88	38.61	34.47	0.120	10.005	21.6	5.4	0.0	0.0	0.00	0.40	0.001	1.000	Soil Mass Translocated (kg)	= 41.2
Totals			379.3										408.09	1.000			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 06 12 91)																
3 1	1 T	23.34	21.23		43.15	39.26	0.099	10.014	29.9	21.4	97.3	20.7	2.07					
	B	23.89	21.57	42.80	42.81	38.66	0.107	10.016	91.8	110.4	502.5	108.4	10.84	12.90	0.041	0.041	Bulk Density at to (kg/m3)	= 1619
	2 T	22.86	20.77		39.09	35.53	0.100	10.012	52.0	61.5	279.9	58.1	5.81					
	B	17.97	16.16	36.93	32.37	29.12	0.112	10.020	288.6	287.5	1307.8	211.3	21.13	26.95	0.086	0.127	Background Cl (g/m2)	= 0
	3 T*	23.82	21.56		36.86	33.37	0.105	10.014	92.5	111.2	506.0	109.1	10.91					
	B*	21.14	18.89	40.45	40.68	36.36	0.119	10.010		568.9	2590.5	489.4	48.94	59.85	0.191	0.318	Cl Added to Plot (g)	= 475
	4 T*	22.61	20.24		39.51	35.38	0.117	10.007		750.5	3418.4	692.0	69.20					
	B	15.79	14.14	34.38	41.70	37.35	0.117	10.014		479.0	2180.2	308.2	30.82	100.02	0.319	0.637	Total Cl Measured at ti (g)	= 313.7
	5 T	23.54	21.00		31.98	28.54	0.121	10.016	284.7	284.3	1293.9	271.7	27.17					
	B	21.76	19.16	40.16	33.82	29.79	0.135	10.002	204.5	214.8	978.7	187.5	18.75	45.93	0.146	0.783	Added Cl Recovered at ti (g)	= 313.7
	6 T	21.88	19.19		41.03	35.98	0.140	10.017	285.5	285.0	1296.8	248.8	24.88					
	B	18.77	16.76	35.95	40.64	36.31	0.119	10.018	61.4	73.3	333.3	55.9	5.59	30.47	0.097	0.880	Cl Recovery Ratio	= 0.660
	7 T	23.97	21.28		37.90	33.65	0.126	10.015	130.9	149.9	682.2	145.1	14.51					
	B	23.65	20.74	42.01	41.03	35.98	0.140	10.017	37.2	36.3	165.4	34.3	3.43	17.94	0.057	0.937	Cl Translocated from Plot (g)	= 39.9
	8 T	19.70	17.43		39.49	34.95	0.130	10.006	40.7	44.8	204.1	35.6	3.56					
	B	17.35	15.30	32.73	39.28	34.65	0.133	10.013	36.7	35.0	159.4	24.4	2.44	6.00	0.019	0.956	Cl Not Translocated (g)	= 273.9
	9 T	21.16	18.64		36.72	32.35	0.135	10.004	41.4	46.5	212.0	39.5	3.95					
	B	21.04	18.38	37.02	43.21	37.76	0.144	10.007	38.8	40.1	182.8	33.6	3.36	7.31	0.023	0.980	Soil Volume Translocated (m3)	= 0.035
	10 T	20.23	17.62		34.03	29.64	0.148	10.013	31.7	24.7	112.7	19.8	1.98					
	B	19.95	17.42	35.04	38.79	33.89	0.145	10.010	46.9	55.2	251.2	43.8	4.38	6.36	0.020	1.000	Soil Mass Translocated (kg)	= 56.7
Totals				377.5										313.73	1.000			
		(extracted 10 91, analysed 06 12 91)																
3 2	1 T	21.82	19.46		38.23	34.10	0.121	10.007	223.6	195.0	888.3	172.8	17.28					
	B	17.40	15.53	34.99	31.11	27.78	0.120	10.005	33.9	24.4	111.4	17.3	1.73	19.01	0.041	0.041	Bulk Density at to (kg/m3)	= 1619
	2 T	22.08	19.84		36.55	32.85	0.113	10.018	327.0	533.6	2427.9	481.7	48.17					
	B	14.83	13.14	32.98	37.88	33.57	0.128	10.007	361.5	599.3	2729.7	358.7	35.87	84.03	0.183	0.224	Background Cl (g/m2)	= 0
	3 T	21.41	19.22		32.30	29.00	0.114	10.015	189.3	814.1	3705.3	712.0	71.20					
	B	23.53	21.01	40.22	41.91	37.42	0.120	10.015	321.5	522.6	2378.6	499.6	49.96	121.16	0.264	0.488	Cl Added to Plot (g)	= 475
	4 T	21.51	19.26		31.89	28.56	0.117	10.001	174.5	797.8	3635.9	700.2	70.02					
	B	16.92	15.15	34.41	36.10	32.34	0.116	10.013	359.5	592.0	2694.7	408.3	40.83	110.85	0.241	0.729	Total Cl Measured at ti (g)	= 459.6
	5 T	22.58	20.19		37.08	33.16	0.118	10.008	289.2	468.8	2135.1	431.1	43.11					
	B	21.09	18.77	38.96	38.44	34.21	0.124	10.016	370.6	307.4	1398.8	262.5	26.25	69.36	0.151	0.880	Added Cl Recovered at ti (g)	= 459.6
	6 T	23.61	21.07		37.14	33.15	0.120	10.014	180.1	162.4	739.1	155.7	15.57					
	B	18.50	16.46	37.53	38.67	34.42	0.123	10.003	97.4	97.7	445.3	73.3	7.33	22.90	0.050	0.930	Cl Recovery Ratio	= 0.968
	7 T	23.79	21.20		41.16	36.69	0.122	10.016	83.6	85.3	388.1	82.3	8.23					
	B	22.33	19.88	41.08	38.67	34.43	0.123	10.020	45.2	44.6	202.9	40.3	4.03	12.26	0.027	0.956	Cl Translocated from Plot (g)	= 103.0
	8 T	21.53	19.26		37.34	33.40	0.118	10.017	47.2	46.6	212.2	40.9	4.09					
	B	14.60	13.06	32.32	37.80	33.83	0.117	10.007	44.0	43.4	197.5	25.8	2.58	6.67	0.015	0.971	Cl Not Translocated (g)	= 356.6
	9 T	23.26	20.59		36.37	32.20	0.130	10.016	56.8	56.6	257.7	53.1	5.31					
	B	18.36	16.06	36.64	32.73	28.63	0.143	10.019	35.2	26.7	121.4	19.5	1.95	7.26	0.016	0.987	Soil Volume Translocated (m3)	= 0.029
	10 T	23.39	21.23		38.40	34.86	0.102	10.006	34.4	25.3	115.2	24.5	2.45					
	B	17.61	15.95	37.18	39.73	36.00	0.104	10.014	50.9	50.5	229.9	36.7	3.67	6.11	0.013	1.000	Soil Mass Translocated (kg)	= 46.4
Totals				366.3										459.62	1.000			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 03 06 92)																
3 3 1	T	21.81	19.98		38.84	35.60	0.091	10.006	20.5	4.7	21.4	4.3	0.43					
	B	22.64	20.63	40.61	34.48	31.43	0.097	10.013	245.5	212.1	965.5	199.2	19.92	20.35	0.057	0.057	Bulk Density at to (kg/m3)	= 1619
2	T	22.16	20.00		38.99	35.20	0.108	10.021	189.8	169.3	769.9	154.0	15.40					
	B	22.62	20.62	40.63	36.46	33.25	0.097	10.020	140.0	646.1	2939.3	606.2	60.62	76.02	0.212	0.268	Background Cl (g/m2)	= 0
3	T	23.43	21.24		33.49	30.37	0.103	10.014	103.5	489.8	2229.3	473.6	47.36					
	B	21.67	20.09	41.34	38.03	35.27	0.078	10.008	90.5	432.2	1968.4	395.6	39.56	86.91	0.242	0.510	Cl Added to Plot (g)	= 475
4	T	23.19	20.97		39.01	35.28	0.106	10.014	117.9	552.5	2514.7	527.3	52.73					
	B	22.94	21.37	42.34	39.71	37.01	0.073	10.020	263.2	225.1	1023.8	218.8	21.88	74.61	0.208	0.718	Total Cl Measured at ti (g)	= 359.3
5	T	21.45	19.46		41.97	38.09	0.102	10.019	92.2	439.4	1999.1	389.1	38.91					
	B	21.86	20.27	39.74	39.64	36.77	0.078	10.015	166.9	149.9	682.0	138.2	13.82	52.74	0.147	0.864	Added Cl Recovered at ti (g)	= 359.3
6	T	22.64	20.36		35.56	31.99	0.111	10.020	215.0	189.0	859.9	175.1	17.51					
	B	22.94	21.01	41.38	32.55	29.82	0.092	10.016	57.7	54.0	245.8	51.6	5.16	22.68	0.063	0.928	Cl Recovery Ratio	= 0.756
7	T	24.76	22.34		33.84	30.54	0.108	10.013	66.1	62.4	284.1	63.5	6.35					
	B	22.62	20.84	43.18	40.58	37.40	0.085	10.010	61.8	58.1	264.7	55.2	5.52	11.86	0.033	0.961	Cl Translocated from Plot (g)	= 96.4
8	T	23.00	20.58		37.60	33.64	0.118	10.010	45.9	42.5	193.7	39.8	3.98					
	B	21.68	20.07	40.64	39.20	36.29	0.080	10.010	39.9	33.6	153.0	30.7	3.07	7.05	0.020	0.980	Cl Not Translocated (g)	= 263.0
9	T	21.67	19.35		40.22	35.93	0.119	10.010	41.3	35.7	162.7	31.5	3.15					
	B	16.76	15.40	36.75	39.85	36.63	0.088	10.012	31.3	22.2	101.2	15.6	1.56	4.71	0.013	0.993	Soil Volume Translocated (m3)	= 0.028
10	T	23.06	20.56		37.10	33.11	0.120	10.014	22.4	8.0	36.6	7.5	0.75					
	B	26.08	24.67	45.23	40.98	37.59	0.090	10.012	25.5	14.6	66.6		1.64	2.39	0.007	1.000	Soil Mass Translocated (kg)	= 44.8
Totals				409.8										359.31	1.000			
		(extracted 10 91, analysed 05 06 92)																
1 2x 1	T	13.80	12.61		35.90	32.80	0.094	10.018	15.7	3.3	15.0	1.9	0.19					
	B	15.01	13.89	26.49	35.75	33.08	0.081	10.014	73.2	67.3	306.1	42.5	4.25	4.44	0.011	0.011	Bulk Density at to (kg/m3)	= 1619
2	T	23.81	21.66		29.90	27.21	0.099	10.015	69.1	63.4	288.7	62.5	6.25					
	B	23.13	21.20	42.87	33.48	30.70	0.091	10.009	126.3	570.8	2599.2	551.1	55.11	61.37	0.152	0.163	Background Cl (g/m2)	= 0
3	T	21.48	19.71		40.50	37.17	0.090	10.010	122.2	553.6	2520.7	496.8	49.68					
	B	21.92	20.34	40.05	36.42	33.81	0.077	10.019	115.0	523.2	2380.2	484.2	48.42	98.10	0.243	0.406	Cl Added to Plot (g)	= 475
4	T	22.60	20.85		38.37	35.40	0.084	10.017	142.1	636.1	2894.6	603.4	60.34					
	B	24.80	23.45	44.30	40.82	38.61	0.057	10.012	321.4	269.5	1227.0	287.8	28.78	89.12	0.221	0.627	Total Cl Measured at ti (g)	= 403.4
5	T	24.17	22.21		39.51	36.32	0.088	10.017	105.0	480.5	2186.5	485.7	48.57					
	B	19.74	18.36	40.58	35.89	33.40	0.075	10.020	344.4	288.0	1310.0	240.5	24.05	72.63	0.180	0.807	Added Cl Recovered at ti (g)	= 403.4
6	T	23.99	22.26		35.33	32.78	0.078	10.015	236.3	202.5	921.6	205.1	20.51					
	B	23.47	21.71	43.96	34.33	31.76	0.081	10.005	211.3	182.4	831.0	180.4	18.04	38.55	0.096	0.903	Cl Recovery Ratio	= 0.849
7	T	21.64	19.66		39.03	35.47	0.100	10.015	126.6	114.4	520.7	102.4	10.24					
	B	22.13	20.01	39.67	31.29	28.30	0.106	10.012	99.5	91.4	416.1	83.3	8.33	18.56	0.046	0.949	Cl Translocated from Plot (g)	= 65.8
8	T	21.16	19.25		35.63	32.43	0.099	10.022	82.0	75.5	343.4	66.1	6.61					
	B	15.87	14.27	33.53	32.81	29.53	0.111	10.019	96.4	88.7	403.4	57.6	5.76	12.37	0.031	0.979	Cl Not Translocated (g)	= 337.6
9	T	20.66	18.78		30.30	27.56	0.100	10.016	34.9	28.1	127.9	24.0	2.40					
	B	16.72	15.07	33.85	30.74	27.72	0.109	10.016	49.3	45.1	205.1	30.9	3.09	5.49	0.014	0.993	Soil Volume Translocated (m3)	= 0.033
10	T	23.74	21.47		32.84	29.70	0.106	10.009	24.9	17.8	80.9	17.4	1.74					
	B	21.04	18.59	40.06	33.02	29.18	0.131	10.012	21.7	12.3	56.2	10.4	1.04	2.78	0.007	1.000	Soil Mass Translocated (kg)	= 53.7
Totals				385.4										403.41	1.000			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements: Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements: Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot	
		(extracted 10 91, analysed 04 06 92)																
2 1x	1 T	19.76	17.81		43.72	39.41	0.109	10.012	14.0	1.8	8.0	1.4	0.14					
	B	14.73	13.13	30.94	36.59	32.62	0.121	10.014	37.7	32.2	146.5	19.2	1.92	2.07	0.006	0.006	Bulk Density at to (kg/m3)	= 1619
	2 T	21.40	19.24		41.67	37.47	0.112	10.015	67.6	63.1	287.3	55.3	5.53					
	B	16.97	15.17	34.41	34.50	30.86	0.118	10.010	114.8	522.3	2378.5	360.8	36.08	41.61	0.111	0.116	Background Cl (g/m2)	= 0
	3 T	19.76	17.77		37.72	33.94	0.112	10.016	307.3	256.5	1167.3	207.5	20.75					
	B	17.76	15.98	33.75	36.33	32.69	0.111	10.006	171.3	753.5	3432.2	548.4	54.84	75.59	0.202	0.318	Cl Added to Plot (g)	= 475
	4 T	23.56	21.27		35.73	32.26	0.108	10.010	153.2	681.3	3102.2	659.8	65.98					
	B	16.76	15.06	36.33	40.85	36.72	0.112	10.017	133.5	600.7	2733.5	411.7	41.17	107.15	0.286	0.604	Total Cl Measured at ti (g)	= 355.2
	5 T	19.94	17.96		39.54	35.62	0.110	10.009	103.5	474.1	2158.8	387.7	38.77					
	B	20.74	18.48	36.44	37.55	33.47	0.122	10.014	296.8	248.2	1129.6	208.8	20.88	59.65	0.159	0.763	Added Cl Recovered at ti (g)	= 355.2
	6 T	20.43	18.36		32.44	29.16	0.112	10.010	305.6	255.1	1161.5	213.3	21.33					
	B	19.68	17.58	35.94	35.65	31.85	0.119	10.008	286.6	240.4	1094.9	192.4	19.24	40.57	0.108	0.871	Cl Recovery Ratio	= 0.748
	7 T	20.70	18.51		40.55	36.28	0.118	10.011	131.8	119.4	543.7	100.7	10.07					
	B	24.28	21.59	40.11	37.16	33.05	0.124	10.015	49.5	46.3	210.6	45.5	4.55	14.61	0.039	0.910	Cl Translocated from Plot (g)	= 43.7
	8 T	18.05	16.20		37.34	33.52	0.114	10.010	62.3	58.2	265.2	43.0	4.30					
	B	15.39	13.67	29.87	39.11	34.76	0.125	10.010	41.7	37.5	170.5	23.3	2.33	6.63	0.018	0.927	Cl Not Translocated (g)	= 311.5
	9 T	19.99	17.87		42.75	38.23	0.118	10.007	42.0	37.8	172.2	30.8	3.08					
	B	18.84	16.78	34.65	40.11	35.73	0.123	10.012	28.1	21.0	95.6	16.0	1.60	4.68	0.012	0.940	Soil Volume Translocated (m3)	= 0.038
	10 T	25.94	23.19		37.86	33.85	0.119	10.020	23.1	15.1	68.5	15.9	1.59					
	B	24.76	22.08	45.26	40.98	36.55	0.121	10.014	20.6	10.5	47.8	10.5	1.05	2.64	0.007	0.947	Soil Mass Translocated (kg)	= 62.1
Totals				357.7										355.20	0.947			
		(extracted 10 91, analysed 04 06 92)																
2 3x	1 T	19.43	17.24		35.29	31.31	0.127	10.020	16.0	3.8	17.3	3.0	0.30					
	B	18.45	16.40	33.64	35.38	31.46	0.124	10.009	217.4	186.4	848.6	139.2	13.92	14.22	0.035	0.035	Bulk Density at to (kg/m3)	= 1619
	2 T	20.86	18.56		33.17	29.52	0.124	10.016	89.3	83.4	379.7	70.5	7.05					
	B	21.84	19.53	38.09	37.82	33.83	0.118	10.017	190.9	829.6	3775.0	737.1	73.71	80.76	0.198	0.233	Background Cl (g/m2)	= 0
	3 T	16.03	14.35		39.77	35.60	0.117	10.006	165.1	728.9	3320.5	476.4	47.64					
	B	20.47	18.36	32.71	39.84	35.74	0.115	10.010	147.1	656.6	2989.6	548.9	54.89	102.53	0.251	0.484	Cl Added to Plot (g)	= 475
	4 T	24.11	21.56		38.79	34.69	0.118	10.016	188.8	821.6	3738.7	806.0	80.60					
	B	25.14	22.45	44.01	41.58	37.13	0.120	10.020	385.2	321.1	1460.8	327.9	32.79	113.39	0.278	0.762	Total Cl Measured at ti (g)	= 388.6
	5 T	23.74	21.07		37.43	33.23	0.126	10.020	394.1	328.5	1494.4	314.9	31.49					
	B	18.01	16.12	37.19	30.62	27.42	0.117	10.012	122.7	111.9	509.6	82.2	8.22	39.71	0.097	0.859	Added Cl Recovered at ti (g)	= 388.6
	6 T	22.86	20.62		29.11	26.26	0.108	10.008	227.2	194.2	884.3	182.3	18.23					
	B	19.50	17.46	38.08	35.63	31.91	0.117	10.013	32.9	26.3	119.9	20.9	2.09	20.33	0.050	0.909	Cl Recovery Ratio	= 0.818
	7 T	20.72	18.59		36.82	33.04	0.114	10.005	57.2	53.4	243.2	45.2	4.52					
	B	22.47	20.10	38.69	39.52	35.37	0.117	10.009	37.4	31.8	144.8	29.1	2.91	7.43	0.018	0.927	Cl Translocated from Plot (g)	= 95.0
	8 T	22.28	20.04		43.60	39.23	0.111	10.020	69.0	64.5	293.4	58.8	5.88					
	B	23.31	20.88	40.92	39.09	35.02	0.116	10.016	19.6	8.8	40.1	8.4	0.84	6.72	0.016	0.944	Cl Not Translocated (g)	= 293.7
	9 T	22.24	19.87		42.05	37.58	0.119	10.020	26.6	19.4	88.3	17.5	1.75					
	B	21.47	19.19	39.06	36.64	32.76	0.118	10.009	17.5	5.7	26.0	5.0	0.50	2.25	0.006	0.949	Soil Volume Translocated (m3)	= 0.030
	10 T	22.07	19.76		37.87	33.91	0.117	10.010	18.6	7.3	33.0	6.5	0.65					
	B	19.18	17.12	36.88	38.61	34.47	0.120	10.005	19.3	8.4	38.2	6.5	0.65	1.31	0.003	0.952	Soil Mass Translocated (kg)	= 48.6
Totals				379.3										388.64	0.952			

GROUND SPEED TRIALS 1991 (Moldboard Plow - W to E)

Treatment Plot	Sample	Field Measurements Soil+ Water (kg)	Soil (kg)	Soil (kg)	Laboratory Measurements Soil+ Water (g)	Soil (g)	Water Content (g/g)	Extract Sample (g)	Cl in Extract (ug/ml)	Cl in Extract (ug/ml)	Cl in Soil (ug/g)	Cl in Plot Slice (g/m2)	Cl in Plot Slice (g)	Cl in Plot Slice (g)	PRD (g/g)	SSRD (g/g)	Summary Information for Plot
		(extracted 10 91, analysed 04 06 92)															
1 1x	1 T	22.09	19.94		35.25	31.82	0.108	10.018	226.9	381.3							
	3 T	21.53	19.59		36.10	32.84	0.099	10.015	242.8	405.8							
	B	21.70	19.97	39.56	36.82	33.90	0.086	10.017	410.8	697.8							
	4 T	18.99	17.27		34.35	31.24	0.100	10.014	277.7	467.7							
	B	15.53	14.26	31.53	27.58	25.33	0.089	10.016	288.1	481.0							
	5 T	22.22	20.29		31.37	28.65	0.095	10.020	257.7	428.4							
		(extracted 10 91, analysed 04 06 92)															
2 2x	3 B	22.90	20.41	20.41	38.18	34.03	0.122	10.020	149.0	651.2							
	4 T	20.17	17.96		31.09	27.68	0.123	10.015	152.0	673.2							
	4 B	20.38	18.23	36.18	33.37	29.85	0.118	10.017	260.3	430.2							
	5 T	24.61	21.94		38.37	34.22	0.121	10.009	315.1	516.1							
		(extracted 10 91, analysed 04 06 92)															
3 3x	2 B	22.62	20.62	20.62	36.46	33.25	0.097	10.020	369.7	619.2							
	3 T	23.43	21.24		33.49	30.37	0.103	10.014	281.6	459.5							
	B	21.67	20.09	41.34	38.03	35.27	0.078	10.008	256.0	417.2							
	4 T	23.19	20.97		39.01	35.28	0.106	10.014	306.0	505.3							
	5 T	21.45	19.46		41.97	38.09	0.102	10.019	262.2	428.6							
		(extracted 10 91, analysed 13 12 91)															
2 3x	2 B	21.84	19.53	19.53	37.82	33.83	0.118	10.017	149.9	853.0							
	4 T	24.11	21.56		38.79	34.69	0.118	10.016	150.8	819.1							
		(extracted 10 91, analysed 13 12 91)															
3 1x	1 T	23.34	21.23		43.15	39.26	0.099	10.014	19.3	0.0							
	B	23.89	21.57	42.80	42.81	38.66	0.107	10.016	84.5	100.0							
	2 T	22.86	20.77		39.09	35.53	0.100	10.012	43.1	49.4							
	B	17.97	16.16	36.93	32.37	29.12	0.112	10.020	283.8	281.3							
	3 T	23.82	21.56		36.86	33.37	0.105	10.014	95.0	111.1							